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THE AMERICAN GAS LIGHT JOURNAL

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[OFFICIAL NOTICE.]

November Meeting of the Guild of Gas Managers.

OFFICE OF THE SECRETARY, October 26th, 1894.

The November meeting of the Guild of Gas Managers will be held in Young's Hotel, Boston, at noon of Saturday, November 10th.

A. K. QUINN, Secretary.

BRIEFLY TOLD.

THE ENDING AT WASHINGTON.—As was told in our special correspondence last week from Washington, respecting the history of the 22d annual convention of the American Association, the meeting was successful and harmonious so far as the technical proceedings were concerned, and eminently pleasurable from a social point of view, the local Committee of Arrangements and the Washington Gas Light Company proving their capacity as entertainers in right royal fashion. The Association was fortunate in having such glorious weather, which was simply superb from first to last, and Washington, always a beautiful city, was doubly attractive when viewed through the mellow haze of genuine Indian summer time. In point of attendance, the meeting was close to the record and the officers were energetic and the members fairly prompt in their attendance. To carry on the story from the point where our correspondent stopped—on the morning of Friday, just before the time set for the formal outing of the last day—we may say that the first thing for the day was a visit to the Washington gas works, and a goodly number of inspectors formed the carriage party who viewed the handsome plants on which Washington depends for its gas supply. The works are model ones, and in going through the various departments thereof many machine monuments to the memory of George A. McIlhenny were espied. The works having been inspected, the next move was on to the Navy Yard, and although every section of this busy hive had much to interest the visitor, perhaps the gun shops, where some of the armament for our magnificent marine defenders is being deftly put together, offered the greatest drawing powers. Following that was the excursion down the famed Potomac—more famous for its history than for its beauty as a stream—and never did a merrier nor more congenial party trust themselves to its waves. The Macalester, however, piloted by a clever master, brought the voyagers swiftly to Mount Vernon, which is the well-travelled Mecca of every denizen of America who would at some period of his life look upon the resting place of the Union's greatest uncrowned king. The grounds about the homestead, the homestead, and the tomb of Washington and his wife, are now in that well-kept, well-ordered state that marks the care of those whose reward for their work is the knowledge that it is fittingly done. Too much praise cannot be given to the Association, the success of whose ministrations is so plainly apparent, that has this trust in charge. The trip back was in harmony with the outward journey, and those who participated in it and partook of the Washington Gas Light Company's pleasant, profuse and unobtrusive hospitality have naught to remember save the perfectness of that which was provided for them. The end of the outing came on Saturday in Baltimore, where the party was in the hand of the Maryland Meter and Manufacturing Company, the success

of whose effort is tersely told by a correspondent in our current item columns.

SOME OF THE ODD FEATURES OF THE MEETING.—At one time it looked that the paper list for the meeting would be sparse in point of separate communications, but when the time for reading them came, behold, a plenitude instead of a stint was the Association's portion. Indeed, the numbers presented were in excess of the time at command for their assimilation, and so with regret several were taken as printed and were not discussed. This brings to mind the fact, and it is an undeniable one, that the plan adopted last year of causing the publication of the papers in advance, in the Association's *Quarterly* only, resulted in decidedly more than partial failure. Nor is the reason far to seek, for it seems to us that (some of the numbers were printed in the *Quarterly* for July) such a period is altogether too long to enable the casual reader —and all readers nowadays are more or less under this head—to retain a living interest in a subject, which interest is calculated to live for months. On the whole, the plan of having each paper printed by itself, and then having each paper read by its *author* during the sessions, while his hearers follow the reading by means of separate copies, seems to be productive of the best results, so far as discussion is concerned, anyway, Nor would this system interfere at all with the good work of the *Quarterly*, which has been excellently compiled and edited by Mr. Slater, Jr., but who we fear has received far from just recognition respecting the labor he has devoted to it. Another thing about the paper list was that one of the expected numbers (the paper by Dr. Amory) brought to revealment the unexpected. The Doctor's paper was not in the *Quarterly*—more's the pity—but it was read and discussed with a vengeance. The ludicrous thing in connection with it, however, was that the Council indorsed the Doctor's chapters by voting them as suitable to be read; but not so the Association, who failed to see the point made by him that, in his belief, opposition gas companies and their operations ultimately and finally resulted in a permanent reduction in gas rates. That idea may do for the purpose of forwarding or climaxing the operations now going on in Brookline, Mass., but as a gospel truth it will not do elsewhere. In any event, the paper and the discussion were suppressed, and we hope they will so remain. It might have been just as well to carry the suppression verdict to a goodly part of another discussion that took place; but of that at another time. Harking back over it all, the papers were of a rank and rating superior to those on the average in the American's history, and that is saying much, for it shows the Association has not by any means outlived its usefulness. Oddities apart from the papers are shown in the list of officers chosen, for out of the eight elected this year only six are from the East, wherefore America, according to the Association, is well to this side of the Ohio river. Again, in the declination of Mr. Littleton to keep on in the politics of the Association—he would have been First Vice-President now had he consented to stand for the office; but every one almost looked for this declination on his part, since it was not likely he would serve the American after refusing to go on with the Western in office. The final oddity was shown in the failure to centralize the exhibits of gas apparatus, which were scattered, although they were interesting, particularly the displays made by Messrs. Luther & Lederhos, of this city, and by the Welsbach Company. Other exhibits were made by Mr. Wilkie, the Messrs. Crane, and the Backus Heater Company. Had these been connectedly arranged, very much better results would have accrued all around.

DEATH OF MR. HORATIO S. YOUNG.—We regret to announce the death of Mr. Horatio S. Young, who was a Director in the Toledo (Ohio) Gas Light and Coke Company, and also a son of Mr. Samuel M. Young, the honored President of the same Company. Deceased passed away on the afternoon of Wednesday, October 17, after a lingering illness, and the funeral services were celebrated on the afternoon of the following Friday. He was born in Maumee, Ohio, April 26, 1843, and became a resident of Toledo in 1860, at the time that his father was chosen President of the Toledo National Bank. His first business venture was in the grain business, then he acted as Cashier of the Toledo National Bank, and later on again took up the grain business in conjunction with his brother. He was also interested in the management of the Maumee Rolling Mill, but eventually had to retire from active trading because of failing health. To show how he was regarded by his fellows we give the following excerpt from the action taken by the Toledo Produce Exchange respecting his decease: "We do not recall a more manly, kind hearted and capable young man. In his passing away Toledo has lost a citizen of rare excellence and worth, and this Exchange will long and affectionately remember and sorrow for him as a clear-headed, useful leader in her councils, as well as in the daily round of our business life." For the facts on which this notice is founded we are indebted to Mr. Charles R. Faben, Jr.

[A Paper read before the Society of Gas Lighting.]

Regenerative Benches.

By MR. A. E. FORSTALL, Newark, N. J.

In giving his impressions[1] of the gas industry in America, to the German Society of Gas and Water Engineers, Herr W. von Oechelhauser commented upon the lack of progress in this country in regard to the manufacture of coal gas, referring particularly to the small proportion of generator, or regenerative, benches used. His criticism is true, and should be taken to heart.

Probably the rapid advance of water gas manufacture, beginning in America almost simultaneously with the advent of the regenerative bench in Germany, has deterred many gas companies from installing comparatively expensive plants, considering first cost alone, for the manufacture of a commodity that might soon be driven from the field; but now that the water gas problem has been solved, and one of the greatest values of the gas found to lie in its use as an auxiliary and enricher of coal gas, there is certainly a sufficiently large field for this latter to warrant the application of all possible improvements to its manufacture.

According to old tradition, the retort house is the place where dividends are earned or not earned, and the retort house is a good place in which to begin the improvements. An experience of nearly ten years has convinced us in Newark that regenerative benches are a great improvement over the old style, and, being so, are a necessity in a well regulated coal gas works or water gas works using a retort process. As in all new departures, success has not been attained at one bound, the way towards it having been followed along the line of some failures and many discouragements. This paper is written in the hope that the experience so gained may be of value to others.

First, let us briefly run over the theory of the regenerative bench. In its common usage this term denotes a bench heated by a generator furnace, and provided with more or less elaborate regenerators or recuperators for recovering the heat carried off from the bench by the gases of combustion, though properly the word regenerative refers only to the latter operation. The title is used here in its common meaning.

In ordinary, direct combustion of solid fuel, a large excess of air above the amount required for perfect combustion must be passed through the fuel, thus reducing the actual temperature of combustion below that theoretically possible; and, further, in a bench of retorts located in this way and unprovided with regenerative apparatus, the escaping hot gases, increased in quantity by this same excess of air, carry of a large amount of heat, all of which must be supplied by the fuel.

The regenerative bench reduces both the loss of temperature in the furnace and the loss of heat in the waste gases, by limiting the air supply to the fuel, and recovering in the recuperators the heat of the escaping gases. In the furnace advantage is taken of the property possessed by carbon of combining with different proportions of oxygen. With oxygen in excess, the carbon is completely consumed, and carbonic acid or carbon dioxide, an incombustible gas, is formed, while with a limited supply of oxygen under proper conditions carbonic oxide or carbon monoxide, a combustible gas with a high flame temperature, is produced.

In the generator furnace a limited supply of air (called the primary air) admitted to a deep bed of fuel, forms carbon monoxide, which is in its turn burned to carbon dioxide by a further supply of air (the secondary air), also regulated and limited in amount. The intense heat of combustion of carbon monoxide gives at once a higher temperature than can be attained by direct total combustion of solid carbon, while all gaseous fuel possesses the advantage over solid fuel of greater ease of regulation and increased steadiness of temperature. But if the secondary air is supplied cold, the temperature of the flame is lowered by the abstraction of the heat necessary to raise this air to the resultant flame temperature, and the higher the initial temperature the higher the final temperature. So for the best results it is important that the secondary air should be preheated—the same reasoning applies to the primary air, but in a less degree, as the final temperature is not as high in the furnace. Fortunately an abundant supply of otherwise lost heat is contained in the sensible heat of the waste gases leaving the bench after their work of heating the retorts is finished. Absorb this heat by the secondary air, and if there is any excess by the primary air as well, and just so much heat, or, in other words, fuel, that would otherwise escape unused into the air, is returned to the combustion chamber to do work. This is the theory.

1. See JOURNAL, Aug. 20 and 27, 1894.

In designing the apparatus for putting the theory into practice, the fact that chemical and physical reactions require time for their full and perfect accomplishment must be borne in mind, and all areas and volumes be made amply large to insure slow speed of travel for air and gases through furnace and bench. In the furnace two chemical reactions take place, the combustion of carbon to carbon dioxide, where the primary air first strikes the fuel, and the reduction of this carbon dioxide to carbon monoxide by the taking up of more carbon in the upper part of the fire. Carbon monoxide being the product desired, the bed of fuel must be always deep enough to insure the decomposition of the carbon dioxide. To secure this condition two things are necessary, sufficient depth of fuel when the furnace is full, and sufficient area of furnace to prevent the fuel burning down too low in the interval between one filling and the next. A large area also reduces the speed of travel of air and gases, and thus allows contact between the reagents for a longer time. Of course all access of air to the furnace, except through the primary air ports, must be carefully guarded against. The furnace should have a solid arch completely separating it from the bench proper, thus keeping the primary and secondary combustions entirely distinct. This arch is to be provided with proper outlets for the exits of the furnace gases, these outlets being made amply large, and closed off by loose bricks, if necessary.

The combustion chamber or meeting place of furnace gases and secondary air—that is, the space where the secondary combustion begins—requires most careful designing. Under no circumstances must it be contracted. Only by having it large and roomy can a uniformly high temperature throughout the bench be secured, while if it is small and cramped an intense local heat results that destroys the surrounding material without doing any useful work. So important is this that, in several instances in English practice, the center bottom retort of a bench of 9's has been entirely removed to enlarge the combustion chamber, thus leaving a bench of eight retorts in arch designed for nine. But this is not necessary, as by increasing the width of the arch and reducing the size of the three bottom retorts a sufficiently large combustion chamber can be secured without losing the benefit of the extra retort. To produce a gradual combustion, which also prevents excessive local heating, the secondary air and furnace gases should be travelling in approximately parallel directions when they come together, so that they will mix gradually. Of course no air must be allowed to enter the combustion chamber except through the regular channel of the secondary air ports and flues.

The setting itself must also be open to allow the heat opportunity to thoroughly diffuse itself. No blocks should cross the combustion chamber immediately above the nostrils for secondary air and furnace gases, as it is almost impossible to find material refractory enough to withstand the intense heat existing at that point. All the blocks surrounding the combustion chamber should be of extra quality material to prevent this part of the setting breaking down before the rest.

In the recuperators the rule of slow speed and long contact still holds. The walls between waste gas and secondary air flues should be as thin as is consistent with strength, to allow rapid transmission of heat; and these flues should be designed with a large area of wall surface in proportion to their volume, as gases, not being affected by radiant heat, and being very poor conductors, are best heated by direct contact with hot surfaces. The construction should also be such as to permit the easy examination and thorough cleaning of all horizontal surfaces. Excessive length of recuperator flues is not necessary, air being very quickly heated under proper conditions of contact.

Finally, the dampers regulating the draft upon the bench should be accessible, as much depends upon their careful setting and manipulation.

But, however perfect the design, no regenerative bench will give good results if allowed to run itself. Eternal vigilance is the price of a low fuel account, as well as of the safety of the bench itself. For if handled in the right, or rather the wrong way, heat enough can be generated in a bench of this kind to melt down any material, however refractory, in a few days, while an excess of damper opening or wrong proportions of primary and secondary air will soon show in the use of an increased percentage of fuel. In regulating the bench the damper is the starting point. No such excess of draft is needed as with a direct fired bench. The late Mr. Geo. A. McIlhenny was the first American to discover that the regenerative bench gave its best fuel results when the gases under the furnace arch were at zero pressure—that is, when the draft on the furnace is almost *nil*. This being the case, the dampers should be regulated to produce this condition. Its existence is readily ascertained by opening the charging door of the furnace, when, if the dampers are properly set, the carbon monoxide flame will play lazily back and forth, alternately burning up out of the door and drawing back into the furnace. Any excess of pressure reduces the heat, while excess of draft rapidly increases the fuel percentage. The setting of the dampers in this way is only carrying out the slow speed qualification of our theory. The dampers thus regulated, open the primary air ports far enough to produce the desired temperature in the bench, always supplying enough secondary air to completely consume the carbon monoxide formed in the furnace. Of course an analysis of the waste gases is necessary for very exact proportioning of the secondary air; but, in American gas works, where a chemist is usually not to be had, the following method will give a close approximation: Close the secondary air ports entirely. A large volume of blue flame soon shows at a point of observation in the waste gas flue near the exit from the recuperators. Now open the secondary air ports gradually until this flame disappears, then stop, and the secondary air supply is all right for the existing conditions. It is best to supply enough secondary air to consume all the carbon monoxide produced by the furnace when at its best (that is, just after the cleaning and filling of the fire), even though this implies a slight excess at all other times, since the loss resulting from the cooling effect produced upon the flame, and the extra heat carried out of the bench by this excess of secondary air, is less than that involved in allowing carbon monoxide to leave the setting unconsumed. Any desired changes in heat should be made by increasing or decreasing the primary air opening, each change in the primary air being followed by the necessary change in the secondary air determined as above. These points of proper damper opening and proper relation of secondary to primary air must be carefully and continuously watched by some one of more intelligence than the average retort house fireman, if the best results are to be secured.

To carry out the condition of close regulation of both air supplies, all cracks in the brickwork and all openings around stoppers must be kept carefully pointed up.

Close attention is also needed in regard to the cleaning of the fire, both as to the method pursued and the thoroughness of the operation. No heat can be obtained from a dirty fire, and even though the cleaning is thoroughly done, if the fire is low when cleaned, or if the clinker is allowed to form in such a position that it is necessary to bar it down through the charging door, there will be the same rush of cold air through the setting that is an inseparable accompaniment of the clinkering in a direct fired bench, with the same cooling and racking of the retorts as a result. But with a furnace supplied with a proper amount of steam, an intelligent man can soon learn to clean his fire, well filled before he begins, entirely from the bottom, so that no air can reach the setting without passing through a bed of fuel, and the only change from normal working is that during the cleaning there is a large excess of primary air causing direct combustion in the furnace.

With these conditions of good design and intelligent handling fulfilled, a regenerative furnace can be depended upon to deliver to the retorts any required amount of heat with the consumption of a small quantity of fuel.

After all this precept, the Newark benches may serve as an example. The "nines" are six in number, with Kloenne furnaces and recuperators, but settings of our own design. The skeleton arches are 10 feet wide in the clear, with 23-inch division walls and elliptical arches of 3 feet 2 inches rise, springing from a point 4 feet 10 inches above charging floor line, and 17 feet 10 inches above cellar floor, the height of cellar being 13 feet. If we were to build a new stack, we would give 10 feet 6 inches clear space between walls, to provide extra width of furnace and combustion chambers. The other dimensions we would not change.

The furnace is set directly under the benches, projecting 18 inches beyond the bench front. It is 2 feet 9 inches wide, but should be 3 feet 6 inches, having been narrowed down by the substitution in the lining of heading courses instead of the "stretchers" called for in the original drawing. The grate area is 2 feet 9 inches by 6 feet equal 16½ square feet. The length of 6 feet at grate bars is increased to 7 feet 3 inches under the arch by the sloping back of the back wall. The height from grate bars to bottom of arch at center line of furnace is 7 feet, giving about 6 feet available for depth of fuel. An extra foot would be an advantage. The steam for softening the clinker is made from the water running over a step grate, consisting of a water pan and two steps. The fires are cleaned once in 48 hours.

The producer gas leaves the furnace by 15 openings in the arch. Five of these, along the center line of furnace from back to front, and each 5 feet by 8 inches, deliver into a flue beneath the center bottom retort, whence the gas passes by lateral openings to the combustion chambers on each side. The remaining openings, each 6 feet by 8 inches, and five on each side of the arch, deliver directly into the combustion chambers, the secondary air openings being arranged side by side with them.

The three bottom retorts are 16 inches by 24 inches inside, the others 16 inches by 26 inches, all 9 feet long, the bottom retorts being made smaller to increase the width of the combustion chambers, the outlets from each of which have a total area of 594 square inches, allowing the heat generated here a free passage to the upper part of the bench. The retorts are supported back and front, and at four intermediate points, these supports being 8 inches wide for the bottom retorts, and 5 inches wide for the tops. The center bottom retort, for its whole length and width, rests upon a solid blocking brought up high enough on the side to protect the lower curve of the retort from the flame. The outside bottom retorts are also provided with shield tiles on the combustion chamber side. All the blocks surrounding the combustion chambers are of extra quality Stettin material, the rest of the setting being ordinary Stettin material. The setting is perfectly open, the combustion taking place along the full depth of the bench on each side of the middle retorts, the products passing up, over and around the side retorts. Five small openings, 1¼ inch by 3¼ inch, under each outside bottom retort, allow a small quantity of the gases to pass directly through from combustion chamber to take off flue, in order to secure a better heat on the bottom of these retorts.

The gases pass into the recuperators along the whole length of the bench, the first set of recuperators heating the secondary air. These recuperators are built on each side of the furnace, and contain four courses of Kloenne recuperator blocks, four to a course. These blocks are pierced by vertical openings, 8 inches by 4 inches, for the passage of the waste gases, and horizontal openings, 4 inches by 3 inches, between the vertical for the secondary air. The combined area of the gas passages in each course is 352 square inches. The total area of secondary air passages in each course is 144 square inches. The effective heating surface of secondary air flues is 5,552 square inches, through 1¼-inch walls, and 1,701 square inches, through 2-inch walls. All these figures are for one side of the bench and must be multiplied by 2 to obtain the whole area of passages and surfaces for the bench.

The primary air recuperators are below those for secondary air, receiving the heat left unabsorbed by the secondary air, and have the same area of passages, but only half the surface area of the secondary air recuperators.

The primary and secondary air ports have the same area, 10 inches by 3 inches, on each side, and the average damper opening is 9¼ inches by 9 inches on each side.

The recuperators have been in use for ten years with practically no repairs. The upper work has been reset three times, the present setting being the fourth one. The furnaces have been relieved for a height of 3 feet to 4 feet at the clinkering line each time the benches have been reset.

An analysis of the working results from December 1st, 1893, to October 1st, 1894 (ten months) gives the following figures, Westmoreland coal having been used: Average charge, 339 lbs.; yield per lb., 5 cubic feet; make per retort per 24 hours, 10,170 cubic feet. Average percentage of coke used as fuel, 19.1.

ABSTRACT OF THE PROCEEDINGS OF THE TWENTY-SECOND ANNUAL MEETING OF THE AMERICAN GAS LIGHT ASSOCIATION.

HELD AT BUILDERS' EXCHANGE HALL, WASHINGTON, D. C., OCTOBER 17 AND 18, 1894.

FIRST DAY—MORNING SESSION—Wednesday, October 17.

The Association was called to order at 10 A.M. by the President, Mr. William H. Pearson, of Toronto, Ontario. On motion of Mr. Neal the reading of the records of the last annual meeting was omitted, as they had been published in Vol. X., No. 2, of the *Quarterly*.

ROLL CALL.

Active Members.

Abel, W. G., Atlanta, Ga.
Adams, H. C., Philadelphia, Pa.
Adams, W. C., Richmond, Va.
Addicks, W. R., Boston, Mass.
Africa, W. G., Manchester, N. H.
Amory, Dr. R., Boston, Mass.
Archer, B. F., Camden, N. J.
Bailey, C. B., Washington, D. C.
Battin, I., Omaha, Neb.
Baxter, W. H., Petersburg, Va.
Beadenkopf, G., Baltimore, Md.
Bennett, C. A., Jr., Freehold, N. J.
Betts, E., Wilmington, Del.
Blodget, C. W., Brooklyn, N. Y.
Boardman, A. E., Macon, Ga.
Bowen, W. S., Lebanon, Pa.
Bredel, F., Milwaukee, Wis.
Brown, E. C., New York City.
Buckman, J., Philadelphia, Pa.
Cartwright, W., Philadelphia, Pa.
Chambers, J. S., Trenton, N. J.
Chollar, B. E., St. Louis, Mo.
Clark, W., Philadelphia, Pa.
Clary, E. D., Burlington, Ia.
Coggshall, H. F., Fitchburg, Mass.
Collins, C. R., Philadelphia, Pa.
Corbett, C. H., Brooklyn, N. Y.
Cornell, T. C., Yonkers, N. Y.
Cowdery, E. G., Milwaukee, Wis.
Cressler, A. D., Fort Wayne, Ind.
Curley, T., Wilmington, Del.
Daly, D. R., Jersey City, N. J.
Daniels, J. M., Columbia, S. C.
Davis, F. J., Waltham, Mass.
Dell, J., St. Louis, Mo.
Dickey, C. H., Baltimore, Md.
Egner, F., Norfolk, Va.
Evans, C. H., Chicago, Ills.
Fay, W. J., Denver, Col.
Findlay, J. H., Ogdensburg, N.Y.
Flemming, D. D., Jersey City, N.J.
Floyd, J. R., New York City.
Fodell, W. P., Philadelphia, Pa.
Forbes, J., Chattanooga, Tenn.
Forstall, A. E. Newark, N. J.
Fowler, S. J., Springfield, Mass.
Fry, C. C., Lynn, Mass.
Gandey, A. C., Lambertville, N. J.
Gardner, J., Jr., Pittsburgh, Pa.
Gardner, W., Pittsburgh, Pa.
Gartley, W. H., Philadelphia, Pa.
Gates, F. W., Hamilton, Ont., Can.
Geggie, D. H., Quebec, Canada.
Gerould, C. L., Mt. Vernon, N.Y.
Gifford, N.W., New Bedford, Mass.
Graeff, Geo. W., Jr., Phila., Pa.
Green, Jas., St. Louis, Mo.
Greenough, M. S., Cleveland, O.
Gribbel, Jno., Phila., Pa.
Guldlin, O. N., Ft. Wayne, Ind.
Harbison, J. P., Hartford, Conn.
Harper, G. H., Altoona, Pa.
Harris, J. A., Phila., Pa.
Hauk, C. D., Phila., Pa.
Hayes, C. J., Palatka, Fla.
Hayward, T. J., Baltimore, Md.
Helme, W. E., Phila., Pa.
Hickenlooper, A., Cincinnati, O.
Hookey, G. S., Augusta, Ga.
Humphreys, C. J. R., Lawrence, Mass.
Isbell, C. W., New York City.
Jenkins, E. H., Columbus, Ga.
Kellogg, L. L., Sioux City, Ia.
Keppelman, J. H., Reading, Pa.
Kuehn, Jacob L., York, Pa.
Lamson, C. D., Worcester, Mass.
Lansden, T. J., Washington, D.C.
Leach, H. B., Taunton, Mass.
Learned, E. C., New Britain, Conn.
Learned, W. A., Newton, Mass.
Lillie, L., Phila., Pa.
Littlehales, T., Hamilton, Ont.
Logan, W. J., Brooklyn, N. Y.
Loomis, Burdett, Hartford, Conn.
Ludlam, E., Brooklyn, N. Y.
Lynn, J. T., Detroit, Mich.
Macdonald, B. J., Newburg, N.Y.
Mayer, F. T., Baltimore, Md.
McCleary, A. J., Phila., Pa.
McDonald, Wm., Albany, N. Y.
McElroy, J. H., Pittsburgh, Pa.
McIlhenny, Jno., Phila., Pa.
McIlhenny, Jas. S., Wash'ton, D.C.
McKeige, F., New York City.
Milsted, W. N., New York City.
Neal, G. B., Boston, Mass.
Nettleton, C.H., Birmingh'm, Conn.
Norris, R., Phila., Pa.
Nute, J. E., Fall River, Mass.
Park, W. K., Phila., Pa.
Pearson, W. H., Toronto, Ont.
Pearson, W. H., Jr., Toronto, Ont.
Pinkney, E. A., Utica, N. Y.
Prichard, C. F., Lynn, Mass.
Quinn, A. K., Newport, R. I.
Ramsdell, G. G., Phila., Pa.
Reilly, J. W., Wilmington, N. C.
Rowland, W. L., Phila., Pa.
Russell, D. R., St. Louis, Mo.
Searle, R. M., Johnstown, N. Y.
Shelton, F. H., Phila., Pa.
Sherman, F. C., New Haven, Conn.
Slaney, H. C., Brooklyn, N. Y.
Slater, A. B., Providence, R. I.
Slater, A. B., Jr., Providence, R. I.
Smith, M., Wilkes-Barre, Pa.
Snow, Wm. H., Holyoke, Mass.
Stacey, Wm., Cincinnati, O.
Stiness, S. G., Pawtucket, R. I.
Summers, T. W., Penn Yan, Pa.
Taber, R. B., Boston, Mass.
Thompson, G. T., St. Louis, Mo.
Townsend, S. S., New York City.
Vanderpool, E., Newark, N. J.
Walters, A. H., Johnstown, Pa.
Ward, W. H., Easton, Pa.
Warmington, G. H., Cleveland, O.
Watson, C., Camden, N. J.
Weber, A., New York City.
Weber, O. B., New York City.
White, H. H., Portsmouth, Va.
White, W. H., New York City.
Wilcox, J. W., Macon, Ga.
Williams, E. H., Waterbury, Conn.
Williams, W. L., Paterson, N. J.
Wood, A. C., Syracuse, N. Y.

Associate Members.

Barrows, W. E., Philadelphia, Pa.
Coburn, C. M., Chelsea, Mass.
Cooke, H. G., New York City.
Crane, W. M., New York City.
Hayward, S. F., New York City.
Higgins, C. M., New York City.
Kelly, H. H., Waltham, Mass.
McDonald, D., Albany, N. Y.
Norton, H. A., Boston, Mass.
Osius, G., Detroit, Mich.
Page, A. L., New York City.
Persons, F. R., New York City.
Slocum, F. L., Pittsburgh, Pa.
Stratton, S. S., Chicago, Ills.
Wilbraham, J. S., Philadelphia, Pa.

The Secretary read the Council Report on

APPLICATIONS FOR MEMBERSHIP,

which is as follows:

WASHINGTON, D. C., October 16th, 1894.

To the Members of the American Gas Light Association—Gentlemen: Your Council has approved the following applications for membership and submits them to the Association with the recommendation that they receive favorable action:

Active.

Charles F. Adams, President Portland Gas Company, Portland, Ore.
C. A. Byers, Consulting Engineer, Bristol Gas Lt. Co., Haverford, Pa.
John R. Coates, President Ottawa Gas Co., Ottawa, Canada.
James W. Dunbar, Superintendent New Albany Gas Light Co., New Albany, Ind.
John W. Eakin, Secretary Cairo City Gas Co., Cairo, Ills.
Richard S. Hicks, Secretary Rockville Gas and Electric Co., Stafford Springs, Conn.
Edwin G. Holzer, Sup't. Gas Dep't. Roanoke Gas and Water Co., Roanoke, Va.
W. A. Jeter, Vice-President Macon Gas Light and Water Co., Macon, Ga.
John Leetch, Gen. Manager Washington Gas Light Co., Washington, D. C.
John R. McLean, President Washington Gas Light Co., Washington, D. C.
R. L. Middleton, Sup't. Georgetown Gas Light Co., Georgetown, D.C.
Frank D. Moses, Superintendent Mutual Fuel Gas Co., Chicago, Ills.
George J. Roberts, Gas Engineer United Gas Improvement Co., Philadelphia, Pa.
H. Z. Russell, Sec. and Treas'r. Honesdale Gas Co., Honesdale, Pa.
Levi Stevens, Jr., Manager Gas Works Heat, Light and Power Co., Trenton, N. J.
A. M. Voorhis, President Nyack Gas Light and Fuel Co., Nyack, N.Y.
H. D. Walbridge, Sec. and Treasurer Grand Rapids Gas Co., Grand Rapids, Mich.
Charles D. Woodruff, Chief Engineer Brookline Gas Light Co., Brookline, Mass.
Adolph F. Wehner, Treasurer Summit Gas Light Co., Summit, N.J.

Associate.

Q. S. Backus, Gen. Manager Backus Mfg. Co., Williamsport, Pa.
F. Behrend, Clay Gas Retort Importer, New York City.
Elbert P. Callender, AMERICAN GAS LIGHT JOURNAL, New York City.
D. J. Collins, Ass't Sales Agent United Gas Imp't Co., Phila., Pa.
Jas. L. Hastings, Gen'l Sup't Nat'l Heat and Power Cons. Co., 138 South 6th street, Phila., Pa.
John H. Mansur, President Keystone Meter Co., Royersford, Pa.
Henry A. Mather, Vice-Pres. and Sec'y Greenpoint Chemical Works. Brooklyn, N.Y.
William W. Randolph, Gas Engineer Humphreys & Glasgow, New York City.
W. H. Townsend, Oil Broker, 29 Broadway, New York City.
Joseph D. Weeks, Editor *American Manufacturer*, Pittsburg, Pa.
Frederick A. Wilke, Mfr. of the Wilke China Kiln, Richmond, Ind.

Number of applicants—*Active*	19
" " *Associate*	11
Total	30

Respectfully submitted by the Council.

A. B. SLATER, JR., Secretary. W. H. Pearson, President.

It was voted that the Secretary cast the ballot of the Association for the election of the gentlemen named. The President appointed Mr. Leach and Mr. Chollar as tellers to receive the ballot which the Secretary cast, and Mr. Leach announced the election of all the candidates named. The new members were welcomed by the President to seats with the Association.

REPORT OF THE COUNCIL.

The Secretary read the report of the Council, and on motion of Messrs. Harbison and Stiness, it was accepted and its recommendations adopted.

WASHINGTON, D. C., October 16, 1894.

To the Members of the Association: Gentlemen—Your Council hereby report that the following papers have been approved to be read at this meeting:

1. "Observations on Sundry Methods of Making Water Gas from Bituminous Coal" (Vol. XI., No. 1, page 58), with Supplement (Vol. XI., No. 2, page 169), by Frederic Egner.
2. "Public Ownership of Gas Properties" (Vol. XI., No. 1, page 67), by Walton Clark.
3. "A Small Experimental Plant as an Aid to the Management of a Coal Gas Works" (Vol. XI., No. 2, page 118), by Peter Young.
4. "Some Experiences with the Welsbach Incandescent Gas Lamp" (Vol. XI., No. 2, page 121), by W. S. Rathell.
5. "One of the First Meter Makers in the United States" (Vol. XI., No. 2, page 130), by H. C. Slaney.
6. "Light Wasted in Bad Flames" (Vol. XI. No. 2, page 146), by N. W. Gifford.
7. "Applications of Chemical Technology to Gas Manufacture" (Vol. XI., No. 2, page 149), by Geo. H. Harper.
8. "The Use of Gas for Other Purposes than Lighting" (Vol. XI., No. 2, page 172), by Burdett Loomis.
9. "Taxation" (Vol. XI., No. 2, page 181) by Allen R. Foote (by request.)
10. "Patching Holders while in Use" (Vol. IX., No. 2, page 194), by J. H. Findlay.
11. "Petroleum, Its Products and their Relation to the Gas Industry," by Charles F. Evans.

The following have been appointed a committee to nominate officers for the ensuing year: Frederick H. Shelton, Chairman, David H. Geggie, Frank S. Richardson, George D. Thompson, James Somerville.

The Council also respectfully report that under Article V., Section 17 of the Constitution it has been decided that the only stenographic report of the Proceedings of the Association shall be that taken by the official stenographer.

Under the same section of the Constitution the Council have also established the following By-Laws:

1. The annual payment by each member of $5.00 as provided for in Article IX. of the Constitution shall be $3.00 subscription for the Proceedings of the Association and $2.00 to the General Fund.
2. At the end of each Association year the net cash balance standing to the credit of publication of Proceedings shall be turned into the General Fund.

The Council are sorry to be obliged to report the following named members as having been stricken from the Roll on account of non-payment of dues:

Active Members.

J. Frank Aldrich, Chicago, Ills.,	T. G. Foster, Montgomery, Ala.,
John W. Bates, Hoboken, N. J.,	S. Lewis Jones, Philadelphia, Pa.,
Frank Bierce, Austin, Tex.,	Wm. J. Winegar, Palatka, Fla.,
Arthur F. Cooper, Exeter, N. H.,	H. D. Wagner, Philadelphia, Pa.

Associate Member Robert N. Sumner, Philadelphia, Pa.

The Council have also remitted the unpaid dues and accepted the resignations of

Active Member J. F. Scriver, Montreal, Canada.
Associate Member F. B. Rice, New York City.

The Council desire particulary to call the attention of the members of the Association to the fact that, as manufacturers of gas apparatus and appliances are naturally the best posted men on such subjects, it is very desirable to have, and the Council desires specially to encourage, the writing and presentation of papers by such members at the meetings of the Association.

The Council also desires to call the attention of the members to the fact that the Secretary is, with the approval of the Council, endeavoring to form a library of gas literature for the Association, and the hearty co-operation of every member is specially recommended.

On account of the extremely small number of copies Volume V. of the Proceedings, the Council have fixed the price of that volume at $5.

At the meeting of the Association one year ago the recommendation of the Council that the Proceedings be published in quarterly form was approved by the Association, and during the past year the Proceedings have been issued in that form, and so distributed to the members.

In order that the advance publication to the members of papers for the meetings might be protected for the Association the Secretary has had the same copyrighted, but it is to be understood that the copyright on any paper so covered is, after the same has been presented to and discussed by the Association at its meetings, vested in the author of the paper.

In view of the fact that our Proceedings as published by the Association are a part of the benefits of membership, for which each member pays an annual sum, it is understood that the Proceedings as so published are more particularly for the benefit of the members than of the community at large, and the Council have decided that under By-Law I. and Article IX., Section 51, of the Constitution, each member in good standing is to receive a copy of each issue of the Proceedings as published, and that he may obtain from the Association, by purchase, one extra copy.

The Council have fixed the price of such extra copies, and the price at which a non-member may obtain a single copy of each volume at seven dollars per annum.

The Council after due deliberation and discussion established a minimum schedule of prices at which advertisements would be received and published upon the last pages of each issue of the Proceedings.

In the publication of the Quarterly Proceedings it is understood that any matter published other than the papers written for and the reports of the Proceedings of the Association shall be limited to such statistical and reference matter as the Council may deem to be of value to the members. Respectfully submitted for the Council,

W. H. PEARSON, President.

A. B. SLATER, Jr., Secretary.

ROUTINE BUSINESS.

The Secretary and Treasurer read his reports, and on motion they were received and placed on file.

The President announced that the Federation Committee would not be ready to report until to-morrow.

ELECTION OF OFFICERS.

Mr. Shelton, Chairman of the Nominating Committee, reported the following nominations for officers for the following year, whereupon it was voted that the report be received and the Committee discharged with the thanks of the Association.

President—Walton Clark, Philadelphia, Pa.

First Vice-President—C. J. R. Humphreys, Lawrence, Mass.

Second Vice-President—Irvin Butterworth, Columbus, Ohio.

Third Vice-President—Samuel G. Stiness, Pawtucket, R. I.

Secretary and Treasurer—A. B. Slater, Jr., Providence, R. I.

Members of Council—terms expire 1896—A. C. Humphreys, New York; G. G. Ramsdell, Phila., Pa.; Jerome Croul, Detroit, Mich.; A. E. Forstall, Newark, N. J.

On motion of Mr. White, seconded by Mr. Stiness, Mr. Harbison was authorized by vote to cast the ballot of the Association for the nominees as named, and Messrs. Prichard and Littlehales, as tellers, received the ballot and reported the election of the slate, which was accordingly announced by the President.

The President presented to the Association the President-elect, Mr. Walton Clark, who said substantially as follows:

Mr. President and Gentlemen—When, I joined the American Gas Light Association in this city of Washington 10 years ago, I hoped to some day have something to say to the American Gas Light Association that they would care to listen to. For seven years since then I have been honored with membership in the Council, and in electing me your President you have filled very full the measure of all ambition that I may have had concerning the gas industry. I thank you sincerely, and for the ensuing year I will try to maintain the dignity conferred upon me. (Applause.)

The President then presented the First Vice-President-elect, Mr. C. J. R. Humphreys; the Third Vice-President-elect, Mr. S. G. Stiness; and the Secretary and Treasurer, Mr. A. B. Slater, Jr.; who responded, thanking the Association for the honors conferred.

Mr. Thompson called attention to the fact that Second Vice-President-elect Butterworth was prevented from being present by painful illness; and, on motion, a telegram was ordered sent to him, notifying him of his election to office, and expressing hopes for his restoration to health. It was also voted that the Secretary convey to Mr. A. W. Littleton the regrets of the Association that he would not continue in office, and thanks for services already rendered by him.

An invitation was then extended to all non-member gas men in the city to attend the convention.

PRESIDENT'S ADDRESS.

President Pearson then read his address, which appeared in our last issue.[1]

APPOINTMENT OF SPECIAL COMMITTEES.

The President appointed the following Committees:

President's Address—John P. Harbison, E. G. Cowdery and A. B. Slater.

Next Place of Meeting—Walton Clark, J. P. Harbison, T. Littlehales, E. G. Cowdery and C. F. Prichard.

Several cities were nominated for the next meeting place, and at noon the Association adjourned to 2 P.M.

FIRST DAY—AFTERNOON SESSION.

The Association was called to order at 2 P.M.

The Secretary announced that the Council unanimously recommended Allen R. Foote, of Washington, D. C., for Honorary Membership, and Mr. Foote was elected an Honorary Member of the Association.

READING THE PAPERS.

Mr. Walton Clark then read his paper on

1. See JOURNAL, *ante*, p. 578.

PUBLIC OWNERSHIP OF GAS PROPERTIES.

The development of the industrial socialistic idea in America has naturally found an early expression in the advocacy of municipal or State ownership of the industries that generally are, and admittedly should be, operated as monopolies. Among them the more notable are railroads, telegraph lines and gas properties. These natural monopolies, because of the large investment they represent, the quasi public character of their functions, and the number of their customers and employees, appear to the conscientious socialist peculiarly fitted to form the thin end of the wedge with which he hopes to split our industrial system; while the socialistic demagogue finds in an exaggeration of their powers, privileges and immunities, and of the success attending present public ownership, a theme as certain to secure him applause as it appeals to the prejudice of his auditors.

While in general the reasons for or against public ownership of one industry apply to the discussion of the public ownership of any industry; there are enough facts peculiar to each to justify an independent analysis of the socialistic claims relative to each. Through the courtesy of your Council I am enabled to present to you some of the facts and arguments applying to the gas industry.

Two monographs advocating the affirmative of the proposition that municipalities can, with propriety and advantage, engage in the manufacture and sale of illuminating gas, have been widely quoted. They are: "The Relation of the Modern Municipality to the Gas Supply," by Edmund J. James, Ph.D. of the University of Pennsylvania; and "Municipal Ownership of Gas in the United States," by Edward W. Bemis, Ph.D., now of the Chicago University.

It is my purpose to briefly review the arguments offered by these distinguished authors in support of their position.

Preliminary to this argument Professor James advances the proposition that the burden of proof is on the opponents of public ownership. An inquiry into the nature and purpose of a municipal organization should develop the strength of this contention, if strength it have.

A municipal corporation is formed by the authority of the State, from which it received its charter, with certain duties and privileges, each as expressed in the charter. The true and necessary functions of municipal authority are few and simple of expression. They are the provision and maintenance of public improvements, *i. e.*, pavements, parks, sewers, public buildings, etc., and the exercise of the police power; the latter covering the protection of the health and peace of the community and the property of the citizens. "Its business is to protect property and person, leaving to individuals all the liberty compatible with this protection." Municipalities are purely artificial. Being formed to aid and protect men in the legal exercise of their various talents, they should not assume any function that it is not clearly evident cannot be performed by individuals or associations of individuals without harm to the general interest. The assumption by a municipality of any function that can be performed by individuals is, then, an interference with the natural order that demands a complete demonstration of public advantage for its justification; therefore, the contrary of Prof. James' proposition is true, and the burden of proof is on the advocates of public ownership.

The argument they offer in support of their proposition differs from the usual broad socialistic contention only when it touches upon points peculiar to the gas industry.

They say, (1st) Gas is a necessity. Gas manufacture and supply is of economic necessity a monopoly; and Prof. James, voicing the general sentiment of the advocates of municipal control, writes, "Public ownership is the natural system in all cases of necessary monopolies."

2d. Gas distribution involves occasional disturbance of the surface of the street. The streets are the proper care of the municipality, and, therefore, any business involving their disturbance should be controlled by the municipality.

3d. As a large consumer of gas, in street lighting, a city has an interest in gas manufacture that justifies it in establishing municipal works.

4th. Public ownership of industries tends to purity and efficiency in the management of public affairs.

5th. Gas companies are oppressive in their charges, their product is inferior, and their function can be better and more cheaply performed by the municipality.

That the manufacture and supply of gas in any district should be a monopoly is generally admitted; and if gas were the only satisfactory source of light available for nocturnal illumination, and therefore necessary in every household and upon every street corner within municipal limits, its supply could reasonably be called the monopoly of a necessity.

But the fact is that gas is so far from being a necessity of modern mu-

nicipal life that in the oft cited city of Wheeling, where gas was sold at 75 cents per 1,000 cubic feet, there were in 1891 less than 3,500 premises consuming gas, in a population of 40,000. About one-half of the residences of Wheeling were then lighted from sources other than gas.

The development of the electric light, and the perfecting and cheapening of lamps and lamp oils, are a guarantee of good service, and against extortion, on the part of venders of gas, and will forever prevent gas companies from being monopolists of the supply of a satisfactory artificial illumination. That these sources of illumination are satisfactory is proved by their presence on the premises of the poor, the well-to-do and the rich; in residences, factories and stores. It cannot, then, be held that the supplying of gas, while necessarily a monopoly, is ever the monopoly of a necessity, and that therefore the protection of the public demands that it be municipally controlled.

The common practice among American municipalities of maintaining water works, forms no precedent of value to advocates of municipal gas works. Pure water is the prime necessity to comfort, health, and even to life. There is no substitute for it. No question of economy or choice enters into the matter. Every man must have it, and the need will perish only with the race.

The best argument in favor of municipal control of water works is the necessity of protecting the source of supply from depletion and contamination. A city can legislate to this protection, where the source is within its limits, and can influence State legislation when necessary to the end, as can no private corporation. Such protection is not necessary to the maintenance of the purity, illuminating value, or supply of artificial gas.

The only point common to water and gas supply is that each is taken by the user, as wanted, from an opening upon his own premises, the openings being connected to a common store through pipes laid in the streets. And this brings us to the second argument of the advocates of municipal control.

If an industry involving the occupancy of the subsoil, or the occasional disturbance of pavements, should therefore be municipally controlled, all street railway, electric, telephone and pneumatic tube enterprises, must take their place with the gas business, in the programme of the advocates of municipal works.

That there is no paving necessity justifying the undertaking of all, or any of these, is shown by the facts. Cities trust to contractors to lay their pavements. Their proper repair can be, and in many cases is, secured by the same system that now compels the paving contractor to the discharge of his duty. It may be confidently asserted that pavements broken by gas companies in the conduct of their business are as promptly and thoroughly repaired as are pavements broken by municipal authorities for sewer and other subsoil work. In any event, the pavement question is so easily adjusted that it carries little weight in an argument in favor of municipal ownership of industries.

Argument 3d is quickly answered. At this date the amount of street gas lighting is a small and diminishing quantity. Its place is being occupied by the electric light; and this is true in cities owning gas plants. The city of Wheeling has recently erected an electric plant in part for this purpose. The public lighting is too small a part of the business of gas manufacture and supply to justify a city undertaking municipal works. A municipality cannot be the manufacturer of every article it consumes.

Referring to the 4th argument of the advocates of public ownership, I cannot join Professors James and Bemis in their wholesale denunciation of American governing bodies, and their comprehensive arraignment of the men whose savings are represented by gas shares. I do, however, agree with the former that, if corruptible men are in charge of our public affairs, a change from private to public, or from public to private ownership, "merely changes the form" of the temptation to corruption. The one means to purity in public, as in private business, is purity in the men intrusted with its conduct. Dishonesty found its opportunity before Stevenson or Murdock was born, and cannot be deprived of it by a change to public ownership of railroad and gas properties.

If increased efficiency be the accompaniment of municipal conduct of the gas business, the fact will appear in the analyses necessary to determine the validity of the fifth claim.

This last claim of the municipal control advocates admits of examination in the light of actual experience, and may be proven valid, or overthrown, by the test of figures. Before examining the figures it will be profitable to review the arguments offered in support of their position by writers in the affirmative of the proposition that the conditions surrounding municipalities enable them to operate gas plants more economically than can private companies.

Prof. James, in his monograph above referred to, says: "There are some considerations which go far to justify the statement that the public can manufacture more cheaply than private enterprises. In the first place a city can usually obtain the capital at lower rates than private individuals. * * * * Secondly, since the gas company must be a monopoly, it is peculiarly liable to attacks from the public. * * * * There is an element of risk which must be made good by higher dividends during the periods of rest."

As far as the risk in the business affects a private corporation, and not a municipality, it is within the power of the municipality to at once remove it, to its own and the corporation's advantage. Aside from the tendency of some municipalities to confiscate gas property, by reducing the selling price of gas to a non-remunerative figure, there is but one element of risk to which a private corporation is more liable than a municipality—the risk of gas competition. The electric light, the candle, the oil lamp, are as much to be feared by the municipal plant, run on the principle that it should pay its way in interest, sinking fund, etc., as by the private plant. The light and the heat agent that is to supersede gas in the future, if there be such an agent, is as sure to work out its destiny to the injury of municipal as of private investment. This being true, a municipality that insures to its gas corporation a certain and exclusive tenure removes at once the necessity of the higher rate of interest or dividend, of which Prof. James complains.

A municipality may reasonably exact from the gas company valuable concessions in return for an assured exemption from gas competition. Such an arrangement insures the maximum of advantage to both municipality and company. A number of admirable systems are in actual operation.

In continuing the analysis of this claim to greater possibility of low cost of production under municipal than under private ownership, I will assume that all public officers will be conscientious in the discharge of their duties, and will labor as efficiently in the employ of a municipality as for their own account.

Intelligence and honesty being engaged in the manufacture and distribution of gas, and the purchase of gas making apparatus and materials, for the municipality, we would have the actual labor, materials and repairs cost as low, and quality as high, in municipal as in private works similarly circumstanced. To find the price at which the product of the works must be sold to preserve the equities, there must be added to the cost of labor, materials and repairs, the interest at which the city can borrow money on its gas works bonds; a depreciation charge to cover such wear and tear on the plant as cannot properly be included in the repairs account; a sinking fund, to permit the charging off of apparatus outgrown or become obsolete, and the taxes the plant would return to the city if operated on private account. This would make the gas works simply self-supporting, and the benefit derived by the city treasury, from the existence of the municipal plant, would be only that of a consumer of gas, and directly in proportion to the number of units of volume the city consumed.

The idea of a revenue from the sale of gas by a municipality is utterly repugnant to all ideas of equity. Cheaper gas is the only possible excuse for municipal control. If profit for the reduction of taxation were the object, the minimum of injustice, actual and possible, would be done by adopting an industry the product of which is a necessity to every citizen, and is used by citizens somewhat in proportion to the individual relief from the lightening of the taxation burden. This is probably not true of any industry, and certainly not true of the gas business.

The municipal works being run, as its advocates generally assert it should be, for the purpose of cheapening gas, the gas must, in equity, be sold at its cost, including interest charges, etc.; the city paying the gas works account for all the gas used for public illumination.

The one item of *cost* left to consider, and the only one in which an advantage is claimed for city ownership, is interest on money borrowed for the erection or purchase of works.

As a borrower the city would have no advantage over a private company guaranteed against competition. Money borrowed by the city for application mainly to reducing the cost of living to gas consumers, a class of citizens, must in equity be borrowed upon a gas works bond, a lien upon the gas property and the right to operate the same, and upon this only. It is not fair to borrow upon the credit of the entire people for the benefit of a part. There is a limit to the credit of any municipality, as of any State or individual, at a given rate of interest. The limit is often unknown until reached, but whatever it may be, each dollar borrowed brings it one dollar nearer. The borrowing power of the whole people should be exercised only in providing funds to be expended for the benefit of the whole people—as for pavements, parks, sewers, etc. Nor should the municipality incur the risk, inseparable

from any manufacturing business, for the benefit of any class of citizens, however large. Borrowing upon a gas works bond, as above, removes, in part, the element of risk of loss from failure in the business due to competition, or other cause; for in the event of failure the bond holder takes the works and franchise for the debt. Therefore, the gas works bond of the municipality must be on the same footing, and hence command the same rate of interest as the bond of a private gas company. A parallel line of reasoning demonstrates that justice demands that the gas works bear its portion of the taxation burden.

Therefore, from the conditions just assumed, conditions favorable to the claim of the advocates of municipal ownership, and which will come into existence coincident with the millennium, the conclusion is inevitable, that a municipality cannot make gas at a lower cost than can a private company. Thus is answered the only argument advanced by the Professors above mentioned in support of their claim that public ownership will tend to cheap production.

If the claim that the functions of a gas company can be better and more cheaply performed by a municipality receives any support from experience in public ownership, it should be developed from an examination of the gas undertaking of the city of Wheeling, which Prof. Bemis calls "the most conspicuous example of success in municipal ownership." The latest reports in my possession are dated 1891.

Gas sells in Wheeling for 75 cents per 1,000 cubic feet. According to the books it costs 43.7 cents delivered to the consumer. The accounts make no reference to depreciation, interest or taxes, which must be included in a statement of actual cost. For this argument I accept Prof. Bemis' estimate of depreciation, 2 per cent. Taxes in Wheeling are 1.2 per cent. These charges should obviously be estimated upon the structural value of the plant. Again I accept Prof. Bemis' low estimate, $380,000. Interest must be figured on the investment. This has been sworn to by the Superintendent at $800,000. The rate of interest on Wheeling bonds, with the entire credit of the city as security, is from 4½ per cent. to 6 per cent. A gas works bond would certainly command 5 per cent. These various charges amount to 45.1 cents per 1,000 cubic feet on the gas output of 115,540,000 cubic feet; and, added to the cost as shown on the books, brings the actual cost of the gas to about 14 cents per 1,000 cubic feet more than Wheeling gets for it.

This estimate includes the gas used for public lighting as if sold at 75 cents per 1,000 cubic feet. Crediting all the gas sold to private consumers as paid for, the cost of the gas used for public lighting is $1.44 per 1,000 cubic feet.

The direct inference is that the city of Wheeling is deceiving itself, and in the end will have to pay roundly for its present neglect of depreciation, as it is now paying, in the loss of interest and taxes, for the present luxury of a municipal works.

Wheeling's proximity to the sources of materials is in large part the cause of the apparent low cost of gas. I will not weary you with the analyses necessary to demonstrate that municipal control at Wheeling, as elsewhere in America, has not resulted in low cost or selling price of gas light, costs of materials, etc., being considered. There would be no difficulty in demonstrating the fact.

That the gas is not exceptionally good may be readily demonstrated. The auditor of the city has sworn that the illuminating power of Wheeling gas is from 16 to 18 candles. Superintendent Darrah claims about 18 candles.

There are but 7 of the 21 private companies in the United States, supplying each 100,000,000 to 200,000,000 cubic feet of illuminating gas per annum, that sells a gas of less than 20-candle power. The average for the 21 companies is 22.65 candles, or about 26 per cent. better for private companies, at all comparable with Wheeling. (See Brown's Directory of Gas Companies for data.)

The above is what analysis reveals of the "most conspicuous example of success in city ownership."

I will not weary you with analyses of the accounts of other municipally controlled plants. A statement of what analysis of the Philadelphia situation reveals will suffice.

It is only by neglecting depreciation and taxes, and charging its customers 80 per cent. more per unit of light than is charged by private companies in New York (this item amounting in 1891 to $1,540,000) that Philadelphia was able to make a fair interest on the $20,000,000 that had been offered for the plant and franchise. The price has this year been reduced from $1.50 to $1 per 1,000 feet. A Special Committee of the Select Council of Philadelphia made a report dated March 29, 1894, considering the effect of this reduction upon the revenues of the city. I extract from the report as follows:

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To which add 50 cents per 1,000 for all gas used for public lighting	310,229.00
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A total of	$1,033,391.52
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Armstrong's Improved Plan of Smokeless Combustion of Fuel.

On July 3d, 1894, U. S. Letters Patents (No. 522,187) were granted to Mr. Mylert M. Armstrong, of Philadelphia, for improvements in the smokeless combustion of fuel. Using the words of the specification:

This invention relates to the combustion of fuel for the more com-

from any manufacturing business, for the benefit of any class of citizens, however large. Borrowing upon a gas works bond, as above, removes, in part, the element of risk of loss from failure in the business due to competition, or other cause; for in the event of failure the bond holder takes the works and franchise for the debt. Therefore, the gas works bond of the municipality must be on the same footing, and hence command the same rate of interest as the bond of a private gas company. A parallel line of reasoning demonstrates that justice demands that the gas works bear its portion of the taxation burden.

Therefore, from the conditions just assumed, conditions favorable to the claim of the advocates of municipal ownership, and which will come into existence coincident with the millennium, the conclusion is inevitable, that a municipality cannot make gas at a lower cost than can a private company. Thus is answered the only argument advanced by the Professors above mentioned in support of their claim that public ownership will tend to cheap production.

If the claim that the functions of a gas company can be better and more cheaply performed by a municipality receives any support from experience in public ownership, it should be developed from an examination of the gas undertaking of the city of Wheeling, which Prof. Bemis calls "the most conspicuous example of success in municipal ownership." The latest reports in my possession are dated 1891.

Gas sells in Wheeling for 75 cents per 1,000 cubic feet. According to the books it costs 43.7 cents delivered to the consumer. The accounts make no reference to depreciation, interest or taxes, which must be included in a statement of actual cost. For this argument I accept Prof. Bemis' estimate of depreciation, 2 per cent. Taxes in Wheeling are 1.2 per cent. These charges should obviously be estimated upon the structural value of the plant. Again I accept Prof. Bemis' low estimate, $380,000. Interest must be figured on the investment. This has been sworn to by the Superintendent at $800,000. The rate of interest on Wheeling bonds, with the entire credit of the city as security, is from 4½ per cent. to 6 per cent. A gas works bond would certainly command 5 per cent. These various charges amount to 45.1 cents per 1,000 cubic feet on the gas output of 115,540,000 cubic feet; and, added to the cost as shown on the books, brings the actual cost of the gas to about 14 cents per 1,000 cubic feet more than Wheeling gets for it.

This estimate includes the gas used for public lighting as if sold at 75 cents per 1,000 cubic feet. Crediting all the gas sold to private consumers as paid for, the cost of the gas used for public lighting is $1.44 per 1,000 cubic feet.

The direct inference is that the city of Wheeling is deceiving itself, and in the end will have to pay roundly for its present neglect of depreciation, as it is now paying, in the loss of interest and taxes, for the present luxury of a municipal works.

Wheeling's proximity to the sources of materials is in large part the cause of the apparent low cost of gas. I will not weary you with the analyses necessary to demonstrate that municipal control at Wheeling, as elsewhere in America, has not resulted in low cost or selling price of gas light, costs of materials, etc., being considered. There would be no difficulty in demonstrating the fact.

That the gas is not exceptionally good may be readily demonstrated. The auditor of the city has sworn that the illuminating power of Wheeling gas is from 16 to 18 candles. Superintendent Darrah claims about 18 candles.

There are but 7 of the 21 private companies in the United States, supplying each 100,000,000 to 200,000,000 cubic feet of illuminating gas per annum, that sells a gas of less than 20-candle power. The average for the 21 companies is 22.65 candles, or about 26 per cent. better for private companies, at all comparable with Wheeling. (See Brown's Directory of Gas Companies for data.)

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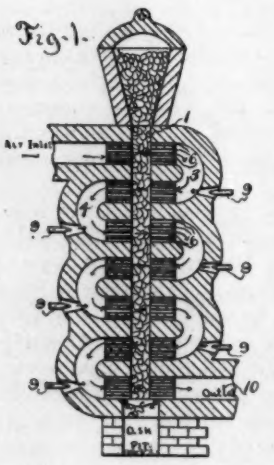
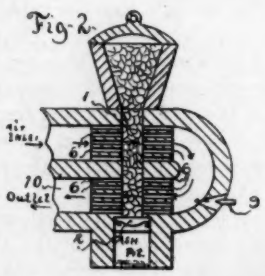
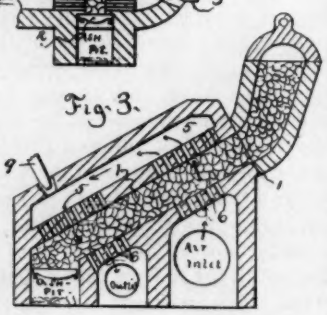
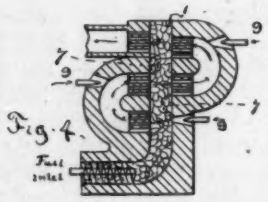
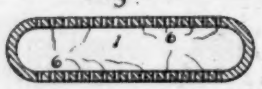
Briefly stated, the process or method may be said to consist in first igniting a charge of fuel in a furnace chamber or retort of considerable length, and permitting it to burn by natural draft until the combustion of the entire fuel column has commenced, the products of combustion during this stage of the operation being permitted to escape, after which the vessel is closed, and currents of air more or less heated are passed transversely through perforations in the retort or furnace, and the fuel column as it is consumed and progresses through the furnace or retort, and further on in the length of the retort returning the gaseous products with additional air or air and steam transversely through the portion of the fuel in the retort or vessel through the portion which has previously been treated and partly consumed, and repeating this operation or process of returning the products of combustion with air, or air and steam, any desired number of times, so that the hydrocarbons and other combustible portions of the fuel become converted into combustible

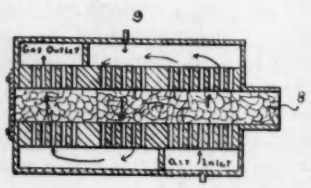












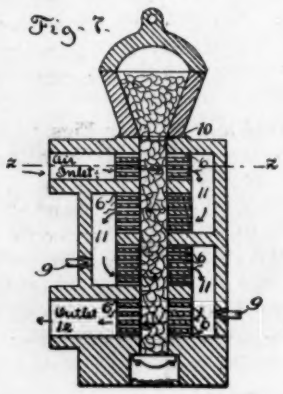
gas which does not precipitate carbon, and is thus consumed with complete exhaustion and good economy of the combustible. As the fuel column in the retort is consumed and subsides, additional fuel is added from time to time, which ignites from that already in the retort and also from the heat of the retort, so that the operation is continuously maintained, and a continuous supply of fuel gas susceptible of smokeless combustion is discharged.

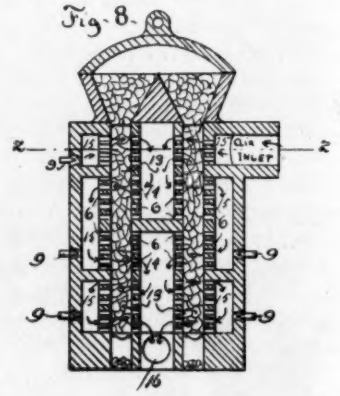
The accompanying drawings represent an apparatus in several forms adapted to conduct this process. Fig. 1 is a vertical section of one form in which the air and products of fuel combustion repass six times through the fuel; Fig. 2, a vertical section, in which they return once and pass twice across and through the fuel, in both these instances being in a vertical chamber or retort. Fig. 3 shows an inclined retort in which a like process is conducted. Fig. 4 shows a vertical retort in which the fuel is fed in at the bottom and forced upwardly, and the gas and products of combustion return twice through the fuel. Fig. 5 shows a cross section of a preferable form of retort for this purpose. Fig. 6 shows a horizontal section of a furnace in which fuel is fed horizontally in the direction of the length of the furnace, and air, or air and steam, transversely through it. Fig. 7, a cylindrical vertical retort or furnace with annular air supplying and gas conducting chambers surrounding it. Fig. 8 shows an annular retort with both a central and an annular series of air supplying and gas conducting chambers. Fig. 9 shows a horizontal section of the furnace depicted in Fig. 7, made in the plane indicated by the dotted line *z*, *z*, in Fig. 7. Fig. 10 shows a horizontal section made in the plane indicated in the dotted line *x*, *x*, in Fig. 8.

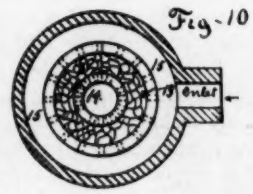
Referring to Figs. 1 and 2, the fuel is supplied in the retort 1, and the fire kindled in the ordinary method as in a stove upon a grate 2, and supplies the fuel until about two-thirds full more or less, the combustion being by natural draft, and the products of combustion during this kindling operation being allowed to waste, and when the fuel is fully ignited, and the retort filled with fuel and closed so as to stop the further waste of the products of combustion, the normal operation commences as follows:

A current of air is passed transversely across the upper part of the retort through the perforated walls 6 thereof, and, entering a chamber 3, returns from said chamber through the fuel and retort to the chamber 4, and thence to another chamber, passing and repassing across and through the fuel; in the meantime fuel is continuously supplied at the top of the retort, and as it is exhausted it sinks and becomes heated to incandescence, and comes in contact with the products of combustion of the former combustions, and air preferably in heated condition, which is admitted in the several chambers 3 and 4, either alone or together with steam, so as to augment the amount of oxygen supplied and increase the liberation or generation of gas. The gas, after finally passing through the fuel, as the fuel becomes exhausted at the grate, may be immediately ignited for use, or may be collected, washed, purified and stored for the purpose of distribution and later consumption.

The distance between the points of discharge of gas and products of combustion from the retort 1 to the point of re-entering the retort from







the channel or chamber 3, should be such relatively to the diameter of the retort that the gases and air or air and steam shall find an easier exit to the next chamber 3 on the opposite side of the retort from the point of re-entrance than by flowing lengthwise through the column of fuel in the retort 1.

Referring to Fig. 3, the retort 1 is placed in an inclined or oblique position, and the fuel fed downwardly through it. In this retort the fuel is ignited in the same manner as in that described in the previous figures, and is similarly fed, the fuel becoming heated to incandescence in its descent as it is exhausted or consumed. Air entering transversely near the upper end, passes through the perforations in the walls 6, and passes across the retort; thence to the chamber 5, where the further supply of air is mingled with it, and again passes transversely through the retort, and through a part of the charge which has already been subjected to the first air supply, with which it combines, and is withdrawn below the retort as combustible gas, whence it is used by being withdrawn for calorific purposes under boilers, and furnaces or other apparatus requiring heat.

In the form shown in Fig. 4 the retort 1 is vertical; fuel, however, is fed at the base and forced upwardly, and the primary air current enters the retort near the base, and rises in the retort and passes transversely across the retort, returning again with an increased supply of

air, and so on, passing and repassing, until the top of the retort is reached. Obstructions 7, 7, as indicated in dotted lines, may be placed in the retort so as to compel the products of combustion to traverse transversely rather than vertically in the retort; but by judicious proportioning of the form of the retort this may become unnecessary. In this retort the fuel is ignited by kindling from the bottom, and the top is left open until the fuel is fully ignited to incandescence, after which it is closed and the normal operation of feeding from below proceeds.

A preferred form of retort is shown in cross section in Fig. 5.

Fig. 6 shows yet another form of retort marked 8, in which the fuel is ignited as in an ordinary furnace and then filled, and thereafter is forcibly fed lengthwise, say from the right to the left, and as it is consumed heats to incandescence in its progress, and the air current passes transversely through it in a horizontal direction, receiving an augmentation of air, or air and steam from the returning channels or chambers 3 at each time when it returns into the retort, so that the air and the free gases resulting from the combination of air and decomposed steam are thoroughly charged with carbon and rendered combustible in the highest practicable degree. The gas thus generated passes through a final contact of the incandescent fuel and has a high heating value. If burned immediately it utilizes the heat developed in its generation, and when stored is adapted to the purposes of gas engine propulsion, metallurgical furnaces, steam generation, and in short to any of the uses to which gaseous fuel may be applied, and with proper burners may be used for culinary and illuminating purposes.

Referring to Figs. 7 and 9, the fuel is ignited as in the case of the retort shown in Fig. 1, and is continuously fed in the top of the cylindric retort 10, and as it is consumed heats to incandescence, and air is introduced through perforations 6, in the retort 10, and gas passed from the retort 10 into the annular chamber 11, where it mingles with additional supplies of air or air and steam, and re-enters repeatedly and passes transversely through fuel in the retort for further combination therewith at points further from the inlet, and the resultant gases are discharged through the flue 12.

Referring to Figs. 8 and 10, fuel is ignited and fed as in Figs. 1, 7 and 9, in the top of a perforated retort 13, but the retort differs in being of annular form, and the products of combustion and additional air or air and steam pass and repass through it to and from central chambers 14, and annular surrounding chambers 15, and is finally discharged for use at the flue 16, and in the same manner and with like effect as in preceding figures.

The several forms of apparatus hereinbefore described and shown are not herein claimed as part of this invention, but are the subject of another application for Letters Patent.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, Oct. 10, 1894.

Mr. Geo. Livesey and the Progress of the Gas Industry.—The Managers of Corporation Gas Works.—Unreasonable Customers.—The Distillation of Tar.

In inaugurating a series of technical lectures in London, a few days since, Mr. Geo. Livesey delivered a very interesting address, in the course of which he alluded to most of the circumstances which affect the selling price of gas. In this respect his utterances will be of great benefit to the somewhat numerous class of newspaper writers and other non-technical persons who from time to time endeavor to deal with this abstruse subject. At first sight it seems obvious that the price of gas should be fairly regular, and that the variations in one district and another must turn upon the question of skillful or unskillful management. But those who have to deal practically with the matter know otherwise, as they find, after every care that competent experience may suggest, there may be circumstances of a disadvantageous character that cannot be avoided. From the history of gas supply in London, Mr. Livesey draws a useful lesson for those who look to competition as a means of reducing the price of gas. "The consumers," he says, "were frequently the promoters of competing companies, which were generally started for the avowed purpose of reducing the price of gas; and although this object was generally attained at first—accompanied generally by a reduction of the already very meager dividends to the vanishing point, the after effect was that the consumers had to pay interest on a very much larger capital than would have been necessary had competition been avoided." The neglect of this important point has led to many districts being loaded with a permanent charge on the price of gas, and yet it is strange that the public even now do not appreciate it at a proper value. Mr. Livesey went fully into details of the evils of competition in London, which became so prominent as to necessitate compulsory districting by the government. And they were subsequently further reduced by amalgamations. Proceeding to speak of the causes conducing to cheap gas, Mr. Livesey instanced several items that have not hitherto been taken into account. One of these was the saving in freightage of coal, due to the substitution of steamers for sailing ships. He might also have added the extension of our railway systems, which has rendered "cartage of coal" a thing of the past in most large gas works. The cost of labor had largely increased, but this had been partly met by the introduction of machinery and labor saving appliances. The most important factor was the large increase of business. In the speaker's own Company nearly 25 times as much gas was used in 1893 as in 1843, and several examples of the economy that follows magnitude were given. Another important point brought out clearly was the fact that companies are interested in selling cheap gas and did their best to supply it. Gas companies had not been unmindful of their duties and responsibilities to the public, and he claimed that the duties had been honorably fulfilled and the responsibilities met in a proper and satisfactory manner. "It was very doubtful if the consumers would be as well served if the supply of gas were in the hands of the municipality, whose main object would be to charge as high a price as possible, in order to get a large sum annually out of the consumers in aid of the rates." Touching upon the future, the speaker said there was no probability of the London gas companies being extinguished, but that a long and successful career might be reasonably expected. "Gas was not played out, nor was it going to be." These few quotations serve rather to indicate the character of the address than to do justice to its value. It contains a great deal of detailed information that will be novel to even the best read gas man. In view of the general demand for knowledge, that is such a characteristic of our time, any attempt in the way of giving accurate and reliable details in a popular style is to be commended.

The responsibility and amount of labor required from the manager of a gas works is continually increasing. There is the demand for cheap gas at one end and higher prices to be paid for coal and for labor at the other. There is the competition from cheap petroleum and the increasing demand for gas for all sorts of purposes, to say nothing of the schemes of persons interested in electric lighting, which are usually directed towards the cream of his business. These various matters cannot be adequately encountered unless the manager possesses, not only the full confidence, but also the hearty sympathy and support of the owners or their active representatives, so that he may be certain of a free hand to apply his abilities to the advantage of all concerned. In the case of a private company, the directors usually have sufficient business acumen to take care that this is the case. They secure the right person in the first place, and then treat him properly. But where the gas works are the property of the municipal authorities, the manager is liable at any moment to become the victim of political or party tactics, or of squabbles that arise entirely outside his sphere of operations. In addition to parliamentary or national politics, there are all sorts of local cliques, such as the labor party, the economical party, the ratepayers' protective association, the Chamber of Commerce, and a dozen others, all of whom are ready to misrepresent, to a greater or less degree, the doings at the gas works, when it suits the particular end in view. If one side becomes pleasantly complimentary or sympathetic, the other side considers it a duty to take the opposite course, quite apart from the merits of the case. In some towns this state of things has been carried to such an extent that the manager is such in name only. He cannot discharge an obstreperous workman without being called upon to rescind his action at the command of some union or other that happens to be strong enough to carry a member for the town council. Only last week a manager (!) was ordered by the council to find employment for a 1-handed man, and that after having expressed inability to do so. In another case, the gas works are known to be doing well, but the manager has to put up with a lot of unpleasantness, simply because the chairman of the Gas Committee happens to be a violent partisan, and as such rouses the ire of his opponents, who are glad to get hold of any kind of a stick to beat him with, current operations at the gas works, or anything else, included. In another town, the economical party upsets the state of affairs. Coal strike or no coal strike, bad year or good year, they will have the annual subsidy towards the rates. So that in bad times the price must be raised, or necessary repairs or extensions staved off, to the prejudice of the undertaking as a whole. Looking at the events that are reported from week to week, one fails to see where the benefit of municipal ownership of gas works comes in, as regards the undertaking, and especially so as regards the manager. Under a

company, he has a fair prospect of satisfying his employers by proper attention to his duties. They will give him a vote of thanks, and perhaps raise his salary. But under the Corporation he has to encounter those who do not want, and who do not mean to be satisfied.

Some little amusement was created in one of the London Police Courts last week by the vagaries of a gentleman who wanted to make his own regulations as to the terms on which he should pay for his gas. The consumer who wants to have things all his own way is no stranger to most of us. We all know the man who cannot get his customers to pay quarterly. "They pay when they like, and he intends to do the same." The collectors, when they wait upon this individual, are treated as persons that have taken a liberty, and he usually manages to give them just as much trouble as they are inclined or compelled to put up with. He pays his last quarter's bill on the day the next one is delivered, and then demands a fresh account not showing the old score, and so on. Our friend, who secured a free advertisement in the London papers, proceeded on the same plan, by refusing to pay a trifling sum demanded of him in the ordinary way, of ignoring the notices that followed. When a fitter went to cut off the supply, he was told that the account "awaited collection," which in other words meant that another insult had been prepared for the collector. The fitter carried out his mission, and the gentleman, finding that no one called, sent to the gas office about closing time, demanding a supply of gas and inclosing £2 deposit, but still refusing to pay the old account. He then re-connected his gas supply, with the result that he was summoned for connecting his pipes to the meter without giving 24 hours' notice, as required by law. At the Police Court he followed the same course, questioning the power of the magistrates to decide the matter, and objecting to go through the usual routine with regard to defendants. The magistrates thought there was practically no defence, and ordered him to pay a fine. He then refused to enter the room where fines were usually received. After being forcibly taken in, he refused to pay. The farce was concluded by the granting, at the request of the Company's solicitor, of a week's grace to pay the money. Before the expiration of that period it is hoped that common sense will prevail. Fortunately it rarely happens that contentions are carried to such extremes. But the incident is a fair illustration of the spirit of pugnacity and unreasonableness which in one way or another is the cause of a great deal of unnecessary trouble to the officials of gas companies.

An important improvement has been affected in the apparatus for distilling tar by Mr. Leonard, of the firm of Messrs. Forbes, Abbott & Leonard. Amongst the advantages claimed for the new apparatus is the important features that the tar is not exposed to the air from the time of leaving the store tank to its ultimate appearance in the form of distillates in the proper receivers, as all circulation takes place in an absolutely tight apparatus. There is no boiling over of stills, no displacement of large volumes of foul gases or running off of large quantities of pitch at a high temperature, and absolutely none of the dirt and smell that are usually to be found in tar works. The apparatus, though it occupies but a small space, will deal with 100 to 200 tons of tar per diem, and, being automatic in action, requires the attendance of one person only. It is also continuous in action, the tar being first heated to the proper temperature by passing through externally heated coils and then delivered to the top of a scrubber of special design, in descending which it meets a current of dry steam, which carries off the volatile matters, the pitch being received at the bottom. The vapors pass off to appropriate condensers, where the heat is absorbed by pipes in which the tar on its way to the coils above mentioned is made to circulate. It is thus raised to a temperature sufficient to enable it to be completely de-hydrated, and this preliminary removal of the water and of the ammonia, etc., appears to be an important feature. As the tar is always in motion, there is no liability to stoppages in the pipes. The heat is so delicately regulated that the quantity of permanent gas produced is inconsiderable. Those who are acquainted with the old order of tar distilling will see in this apparatus the dawning of a new era.

The matter is especially interesting to gas managers who have to face the question of distilling their own tar. Those who have hitherto been deterred by the danger, the risk and the filthiness of the ordinary tar still, from undertaking the working up of tar, may now be induced to reconsider the question.

The Glens Falls (N. Y.) Gas Light Company has made a claim against the town authorities for damages done to its mains by the contractors, who are acting under the direction of the Board of Sewer Commissioners in sewering the town. The damages are estimated at $2,680.57, and the claim has been referred to the Board.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

MISS ANNA BARROWS, whose clever "lectures on food and demonstrations of cookery" have made her well known amongst Eastern gas men, has established a school of domestic science at No. 40 Berkeley street, Boston, Mass.

AT the annual meeting of the Denver (Col.) Consolidated Gas Company the following officers were elected: President, J. B. Grant; Vice-President, George Coppell; Secretary and Treasurer, A. H. Branch; Directors, J. B. Grant, George Coppell, Dennis Sullivan, I. N. Seligman, J. F. Vail, J. A. Thatcher, H. F. May, H. M. Porter and W. J. Fay.

THE Wilmington (Del.) newspapers say that Mr. J. Edward Addicks recently offered to sell the plant constructed by him some time ago for the Oxy-Hydrogen Gas Company, of Wilmington, Del., to the Wilmington Coal Gas Company, at a price said to be very much less than the amount it cost to build. He further agreed to take stock in the Wilmington Company in payment. The newspaper talk is also to the effect that the offer was refused. The Oxy-Hydrogen Company has never been able to obtain the sanction of the authorities to its use of the streets.

THE following sensible notice has been prominently printed in the Cincinnati newspapers, by the Cincinnati Gas Light and Coke Company: "The changes of temperature usual at this season of the year are liable to cause for a brief period a deposit of naphthaline in service pipes and meter connections, causing an obstruction and curtailment of supply. If consumers will immediately, upon noticing any diminution of pressure, promptly notify the Gas Company, either personally, by postal, or telephone to No. 167, a remedy will be at once applied, by Henry Felt, Superintendent of Distribution."

WE regret to announce the death of Mr. S. D. Hess, the Superintendent of the Citizens Water and Gas Company, of Shenandoah, Pa.

MR. W. M. ENGLEY, of Augusta, Me., is in charge of the improvements being made on the plant of the Port Jervis (N.Y.) Gas Company. It has been decided to erect an office on Brown street, and the proprietors are well pleased at the prospect of an increased business.

THE people of Crestline, Ohio, recently voted in special election to determine whether or not the city should issue bonds for the purpose of installing an electric lighting plant to be operated on municipal account. The scheme was voted down.

"OBSERVER" forwards the following: "The announcement that the Salem (Mass.) Electric Light Company and the Salem Gas Company were to consolidate appears to have been based upon the following conversation. Some days ago a Director of the Electric Light Company approached an official of the Gas Company and suggested that the Directors of the latter corporation consider the matter of consolidation with the former Company. On being informed that the Gas Company was disposed to continue business as at present, it was intimated by the Electric Light Company's representative that the consolidation could be brought about by buying up a majority of the Gas Company's stock, but as the capital of the Gas Company is represented by 300 shares, and as only 16 are on the market, the chances of immediate consolidation did not concern the Gas Company official. Aside from transfers of stock caused by deaths of original owners, only one share of Gas Company stock has been sold for a long time, the holders being satisfied that the investment is all right."

JUDGE MCKENNA, of the United States Circuit Court, District of San Francisco, rendered an important decision some days ago, for it means that many blocks of lands under tide water beyond Black Point in San Francisco will be reclaimed. The decision was handed down in the case of the Pacific Gas Improvement Company against the city and county of San Francisco, and Messrs. Warren & Malley, contractors. Some time ago the Supervisors decided to award a contract to Messrs. Warren & Malley to fill in a mile of land along Lewis's reef. The Pacific Gas Improvement Company then sued out an injunction restraining the city officials from awarding the contract and Warren & Malley from going ahead with the contract. Judge McKenna issued a restraining order preventing the execution of the contract and then heard the injunction proceedings. On October 15 he dissolved the restraining order and told Warren & Malley to proceed with the work. The Gas Company's plant is located on the verge of the land now to be reclaimed,

hence the Company can have vessels of heavy draught come almost up to the gates. When the bay in front of the plant is filled up, the Company will be sadly interfered with in that its water way will be spoiled. It was to prevent this that the Gas Company brought the injunction proceedings against the city and the contractors, alleging that as it was the riparian owner of the front no one had any right to fill the bay in front of its plant. Judge McKenna, however, decided against the Company, holding that when the State owned this land it was not disputed that it had the right to do as it pleased with it; therefore those who succeeded the State in possession of the land had the same privileges. On this ground, he said, the city had a perfect right to contract for its filling."

We were in error in the statement that the Worcester (Mass.) Gas Light Company would make a hard-and-fast rate of $1.25 per 1,000, in complying with the recommendation of the Board of Gas and Electric Light Commissioners that the charge for gas be reduced 15 cents per 1,000. The Company has established a gross rate of $1.40 per 1,000, with 15 cents off for prompt payment.

The Board of Gas and Electric Light Commissioners recently heard argument on the petition of the Malden and Melrose (Mass.) Gas Light Company for permission to increase its capital stock in the sum of $30,000. The Company was represented before the Commissioners by Mr. Arthur H. Wellman, who set forth that the Company sought the increase for the purpose of extending its street mains, enlarging its plant and cancelling its debts. There was no opposition and the matter was taken under advisement.

At the annual meeting of the Troy (N. Y.) Gas Light Company the Directors chosen were Messrs. A. B. Banks, A. E. Bonesteel, A. N. Brady, Thos. Breslin, F. E. Draper, Jas. Fleming, S. O. Gleason, G. P. Ide, William Kemp, F. J. Molloy, Edward Murphy, Jr., R. C. Pruyn and William A. Thompson.

At a recent meeting of the Directors of the Mechanicsburg (Pa.) Gas, Heat and Power Company, Mr. J. B. Archer resigned from the post of Manager, and Mr. Leadley also resigned from the Company's service. The office of Secretary and Treasurer was divided, Mr. A. Z. Myers continuing as Secretary and Mr. B. de Schwinitz, of Bethlehem, was elected Treasurer.

Mr. W. P. Elliott, of New Brunswick, N. J., is in Buffalo, in charge of the construction work necessary to keep alive the charter of the Queen City Gas Company, of that city.

The Kansas City Gas Light and Coke Company recently brought before the City Council an ordinance granting it a 30-year franchise, based on the following schedule: Until the sales exceed 250,000,000 cubic feet per annum, $1.50 per 1,000; between 250,000,000 and 350,000,000, $1.45; between 350,000,000 and 400,000,000, $1.40; between 400,000,000 and 500,000,000, $1.35; 500,000,000 and 700,000,000, $1.30; when the sales shall exceed 700,000,000 the rate shall be $1.25 per 1,000 cubic feet, until a new schedule shall be agreed upon. The Company also agrees to give the city 3 per cent. of its gross receipts and to bid on the contract for supplying gas to the city for street lamps.

The "non-partisan party" that is attempting to elect a set of city officers for San Francisco, Cal., favors a platform one of the "planks" of which sets forth the belief that the city should own its own gas works.

A correspondent who was present at Baltimore, Md., on the occasion of the formal opening of the new shops of the Maryland Meter and Manufacturing Company, which "opening" followed in pleasing sequence the Washington Meeting of the American Gas Light Association, has this to say about the inspection: "The city of Baltimore is noted for its true hospitality, emblematic of the grand, old Southern style, and if new proof were asked for that Baltimore's residents are masters in the art of welcoming and entertaining, it was amply furnished, on Saturday, October 20th, to the hundred and more members of the American Gas Light Association (many of whom were escorting their wives or sweethearts), who journeyed to Baltimore from Washington in the special train provided by the attention of the Maryland Meter and Manufacturing Company, which wide-awake concern had just completed handsome new factories that it was not proposed to hide under a bushel—otherwise to conceal from the inspection of the gas men of the land. Those who did not accept the invitation, as well as those who could not accept on account of other business arrangements, missed a truly enjoyable occasion. Besides the members of the Association, there were present at least 50 of the most prominent people of Baltimore, the local celebrities including no less a personage than his honor the Mayor, Mr. Latrobe. Naturally the first business of the day, when the factory was reached, was an inspection of the buildings and machinery, and a very interesting and instructive hour and a half was devoted to examining the property. The buildings, which are of brick, with granite trimmings, are 82 feet by 63 feet, and six stories in height, and the appointments, both exterior and interior, are nothing short of complete. The designers saw to it that every possible provision for the comfort of the workmen was made, and a notable feature is a substantial elevator that makes the transportation of material, etc., to and from the different floors a matter of swiftness and ease. The floors carry the most approved machinery for the different branches of the Company's products, and a very striking point in the construction and planning of the factory is the provision for its natural lighting. The windows are wide and high and many, and no workman's bench or stand will ever be in gloom while the sun is shining. The arrangements for artificial lighting are also excellent. The inspection having been satisfactorily completed, the guests were invited to partake of what their hosts called a luncheon, but which in reality was a banquet, if ever there was one. The delighted party partook of the bounteous hospitality of their hosts to the accompaniment of numbers by an orchestra, whose performance was in every sense artistic. The speech-making was introduced by an address of welcome and congratulation from Mayor Latrobe, and Mr. Samuel G. Stiness responded in his happiest vein. Other speakers who contributed to the mental enjoyment of the occasion were delivered by Messrs. Charles Dickey (of the Maryland Company), W. J. Fay (he of Denver), William McDonald (of Albany), George G. Ramsdell, William Helme, Oscar Weber and others. Fay paid his respects to the ladies—for the matter of that, so did everyone else, and Ramsdell, in his concise style, among other things, said that the prosperity of the meter business was close to the gas industry, for in reality the one was dependent upon the success of the other. The banquet and the speeches were at an end at 2.30, when carriages in waiting were taken by the ladies who were shown many of the embellishments which adorn the handsome Monumental City. Then the hour for train time was at hand and the guests separated, with the pleasures of a pleasant visit burdening their minds. It might and should have been earlier said that the floral decorations of the table and the banqueting hall—the banquet was served on the sixth floor of the building—were superb, one very notable piece representing a 50-light consumers meter, which floral offering stood as a recognition by the Maryland Brass Works of the merit and worth of the Maryland Meter and Manufacturing Company. One circumstance in connection with this inspection which is worthy of note is that this was perhaps the first time that a gas meter factory was thrown open to the public, and that is was also the first time that other gas meter manufacturers were invited to inspect the works of a competitor. This shows a praisworthy liberality of spirit on the part of the Baltimoreans. The Maryland Meter and Manufacturing Company, built up nearly 30 years ago upon the ashes, so to speak, of the old meter industry that was brought to life in the United States, in the city of Baltimore, through the plucky efforts of those who came to us fortified in the meter maker's art from 'Old England,' and it now ranks in the foremost lines of the great meter-making firms of America. In concluding this brief mention of a most enjoyable visit, it is only justice to say that great praise is due to the untiring efforts of Messrs. Charles E. Dickey, James B. Smallwood and Charles H. Dickey, the proprietors of the Company, for the better comfort and entertainment of their guests.—C."

It is proposed to put the matter of a municipal gas and electric light plant before the citizens of Newton, Mass., for decision at the coming city election. The matter has been favorably passed upon by one city government, and if it receives an indorsement at the polls, immediate steps will be taken to secure a plant.

The Committee on Lighting, of the Cambridge (Mass.) City Council, have been instructed to consider the advisability of doing away with all street gas lamps when the contract for gas lighting with the Cambridge Gas Light Company expires on November 16, with a view to the complete ultimate lighting of the streets by electricity.

Mr. Martin A. Church, Superintendent of the Portchester (N. Y.) Consolidated Gas and Electric Light Company, was fatally asphyxiated by the products of combustion which escaped into his sleeping apartment from an ordinary coal heating stove by which the room was heated.

Another opposition gas enterprise for Chicago is on the cards, this time the scheme being based on what the promoters are pleased to term the "co-operative plan." The projectors are said to be Messrs. A. H. Dunham, H. A. Forsyth and John P. Claddo. The concern is capitalized in $15,000,000.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

EDITOR—Jos. R. Thomas, C.E.
ASST. EDITOR—T. J. Cunningham.
MANAGER—C. E. Sanderson.

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MONDAY, OCTOBER 29, 1894.

The Market for Gas Securities.

The event of the week was the nominal supply of gas in the city by the New York and East River Gas Company, but of course the supply is decidedly more nominal than real; further, that such condition will obtain for some length of time. The distribution system is still in a very disjointed state, yet it is enough for the present to know that the Company's gas is in its pipes. Perhaps this fact is largely accountable for the drop in Consolidated values, quotations for which to-day (Friday) are returned at 117½ to 118½, as against 121 to 122 a week ago. Present indications point to a brisk warfare of rates, but no matter what stage the contest may reach Consolidated should not go below 110. Other city shares, save Standard, which is more than holding its own, are a trifle easier. The Brooklyn situation shows no particular change, although it is pretty well understood that consolidation or districting is liable to be announced at any moment. Quotations for Brooklyn shares are nominal, although the figures are somewhat changed from those of a week ago.

Bay State is a trifle weaker, and so is Chicago gas, while Baltimore Consolidated is strong, with no stock offering under 68. Consumers, of Jersey City, advanced to 65 bid, on the declaration of a 3 per cent. dividend, payable Nov. 1. This makes 5 per cent. on the stock for this year, a dividend of 2 per cent. having been paid in July. The bonds are bid for at 95. Laclede is stronger, both as to the preferred and common, and we think the common is a purchase at anything under 20.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks.

16 WALL ST., NEW YORK CITY.

OCTOBER 29.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

	Capital.	Par.	Bid	Asked
Consolidated	$35,430,000	100	117½	118½
Central	500,000	50	103	—
" Scrip	220,000	—	100	—
Equitable	4,000,000	100	170	175
" Bonds	1,000,000	—	106	108
Metropolitan, Bonds	658,000	—	108	112
Mutual	3,500,000	100	145	—
" Bonds	1,500,000	—	100	102
Municipal, Bonds	750,000		—	—
Northern		50	—	—
" Bonds	150,000	—	—	100
Richmond Co., S. I.	348,650	50	50	—
" Bonds	100,000	—	—	—
Standard Gas Co—				
Common Stock	5,000,000	100	35	37
Preferred	5,000,000	100	81	85
Yonkers		50	112	—
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	111	113
Citizens	1,200,000	20	50	—
" S. F. Bonds	320,000	1000	—	101
Equity Gas Light Co.	2,000,000	100	—	—
Bonds	1,000,000	—	—	—
Fulton Municipal	3,000,000	100	150	155
" Bonds	300,000		103	—
Peoples	1,000,000	10	75	—
" Bonds (7's)	368,000	—	100	—
" " (6's)	94,000	—	98	100
Metropolitan	870,000	100	145	—
" Bonds (5's)	70,000	—	—	155
Nassau	1,000,000	25	172	—
" Ctfs	700,000	1000	99	100
Williamsburgh	1,000,000	50	175	—
" Bonds	1,000,000	—	107	110
Out of Town Gas Companies.				
Bay State Gas Co.—				
Stock	5,000,000	50	23½	24
Income Bonds	2,000,000	1000	44	45
Boston United Gas Co.—				
1st Series S.F. Trust	7,000,000	1000	80	83
2d " " "	3,000,000	1000	59	—
Buffalo Mutual, N. Y.	750,000	100	120	—
" Bonds	200,000	1000	95	100
Chicago Gas Company.	25,000,000	100	74¼	74½
Chicago Gas Light & Coke Co.—				
G't'd Gold Bonds	7,650,000	1000	81⅛	81½
Consumers Gas Light Co., Jersey City	2,000,000	100	65	—
Bonds	600,000	1000	95	100
Cincinnati G. & C. Co.	7,000,000	100	192	—
Consumers Toronto	1,600,000	50	184½	187
Central, S. F., Cal.			90	100
Capital, Sacramento, Cal			—	55
Consolidated, Balt.	11,000,000	100	67¾	68
" Bonds	6,400,000		107	107½
Citizens Gas Lt. Co., Rochester, N. Y.	500,000	—	85	101
Bonds	250,000		—	—
Detroit Gas Co.—				
Con. Bonds			—	50
East River Gas Co., Long Island City	1,000,000	100	20	22
Preferred			36	38
Bonds	500,000	100	81	82
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1000	—	101
Hartford, Conn.	750,000	25	120	128
Jersey City	750,000	20	190	200
Louisville, Ky.	2,570,000	50	125	130
Laclede Gas Light Co. St. Louis, Mo.—				
Common Stock	7,500,000	100	18½	19
Preferred "	2,500,000	100	74	75
Bonds	9,034,400	1000	88¾	89
Little Falls N. Y.	50,000	100	—	100
" Bonds	25,000	—	100	103
Montreal, Canada	2,000,000	100	200	208
New Haven, Conn.		25	200	—
Oakland, Cal.			42⅜	43
People's Gas and Coke Co., Chicago—				
1st Mortgage	2,100,000	1000	—	108
2d "	2,500,000	1000	104	105
Peoples, Jersey City	500,000	—	175	185
" " Bonds			—	—
Paterson, N. J.		25	99	102
Rochester, N. Y.		50	80	85
Preferred			90	95
Bonds			90	95
Syracuse, N. Y.	500,000	25	—	—
San Francisco Gas Co. San Francisco, Cal.	10,000,000	100	71	71½
Washington, D. C.	2,000,000	20	240	—
Wilmington, Del.	500,000	50	188	190

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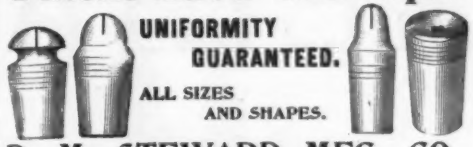

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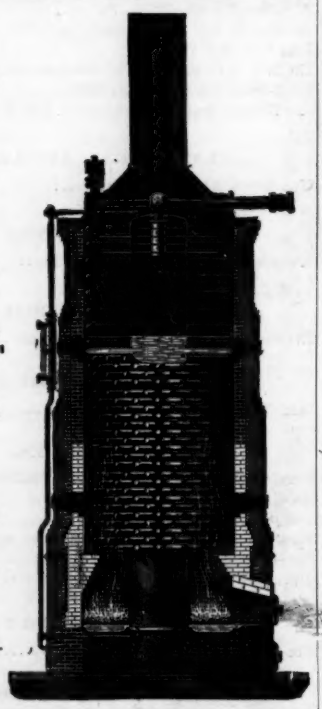

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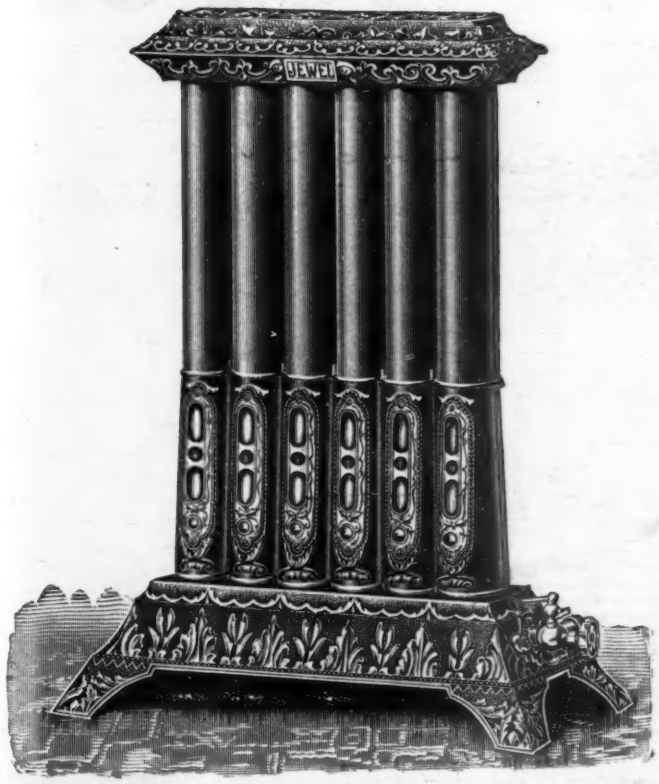

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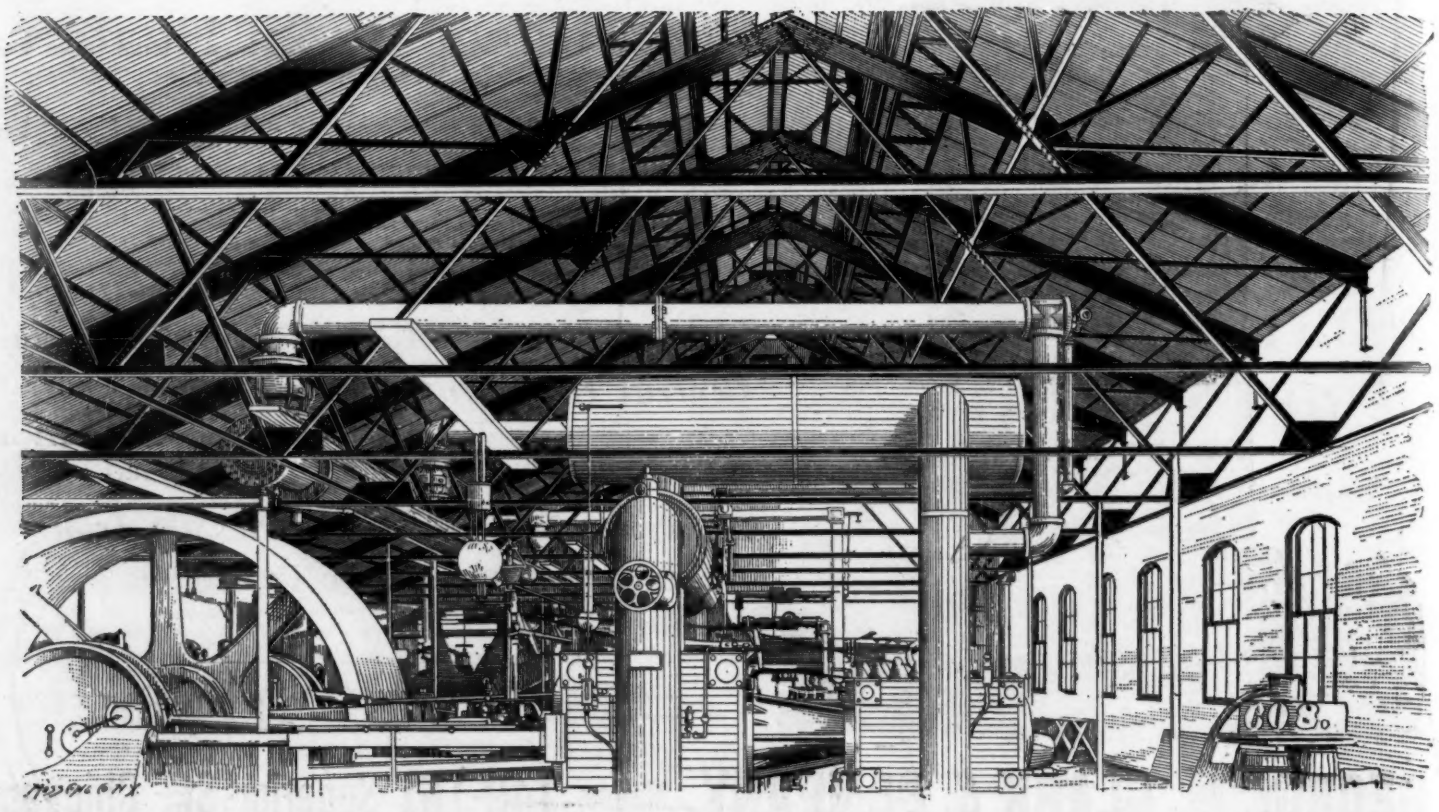

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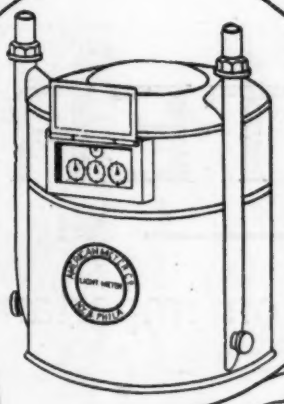

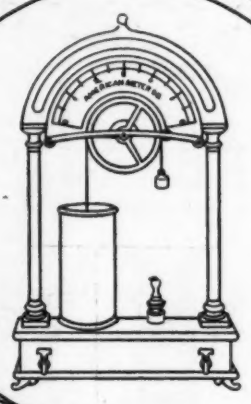

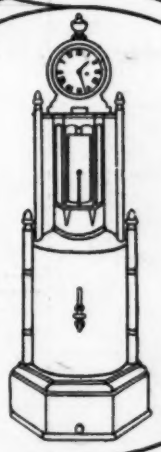

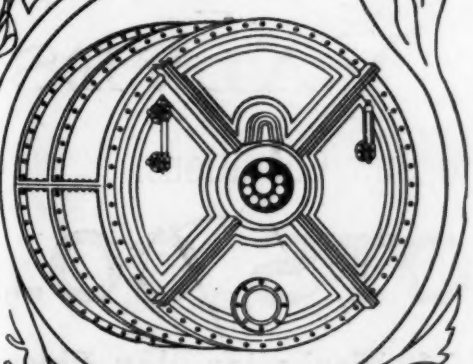

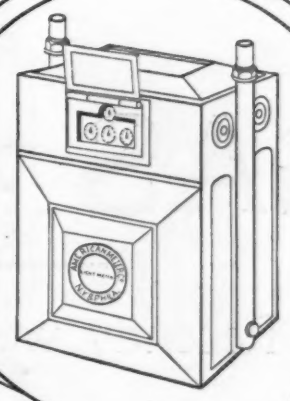

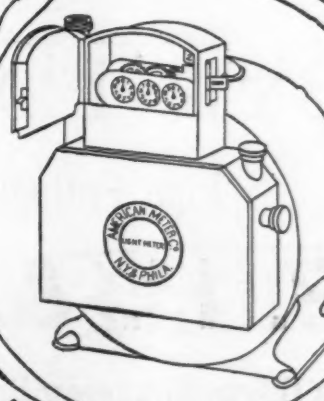

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PUBLIC LIGHTING TABLE.

NOVEMBER, 1894.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Thu.	1	5.30 PM	5.30 AM	4.45	5.35
Fri.	2	7.20	5.30	4.45	5.35
Sat.	3	8.20	5.30	4.45	5.35
Sun.	4	9.20	5.30	4.45	5.35
Mon.	5	10.30 FQ	5.40	4.40	5.45
Tue.	6	11.30	5.40	4.40	5.45
Wed.	7	12.30 AM	5.40	4.40	5.45
Thu.	8	1.30	5.40	4.40	5.45
Fri.	9	2.40	5.40	4.40	5.45
Sat.	10	3.50	5.40	4.40	5.45
Sun.	11	No L.	No L.	4.40	5.45
Mon.	12	No L.	No L.	4.30	6.00
Tue.	13	No L. FM	No L.	4.30	6.00
Wed.	14	5.10 PM	6.30 PM	4.30	6.00
Thu.	15	5.10	7.30	4.30	6.00
Fri.	16	5.10	8.30	4.30	6.00
Sat.	17	5.10	9.50	4.30	6.00
Sun.	18	5.10	11.10	4.30	6.00
Mon.	19	5.10 LQ	12.20 AM	4.25	6.00
Tue.	20	5.10	1.30	4.25	6.00
Wed.	21	5.10	2.40	4.25	6.00
Thu.	22	5.10	3.50	4.25	6.00
Fri.	23	5.10	5.00	4.25	6.00
Sat.	24	5.10	6.00	4.25	6.00
Sun.	25	5.10	6.00	4.25	6.00
Mon.	26	5.10	6.00	4.20	6.10
Tue.	27	5.10 NM	6.00	4.20	6.10
Wed.	28	5.10	6.00	4.20	6.10
Thu.	29	5.10	6.00	4.20	6.10
Fri.	30	5.10	6.00	4.20	6.10

TOTAL HOURS LIGHTING DURING 1894.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January...	244.10	January...	423.20
February...	195.30	February...	355.25
March.....	206.20	March.....	355.35
April.....	169.40	April.....	298.50
May.....	162.10	May.....	264.50
June	135.40	June.....	234.25
July.....	146.30	July.....	243.45
August.....	162.20	August.....	280.25
September..	174.10	September..	321.15
October....	211.20	October....	374.30
November..	221.00	November..	401.40
December..	245.30	December..	433.45
Total....	2274.20	Total...	3987.45

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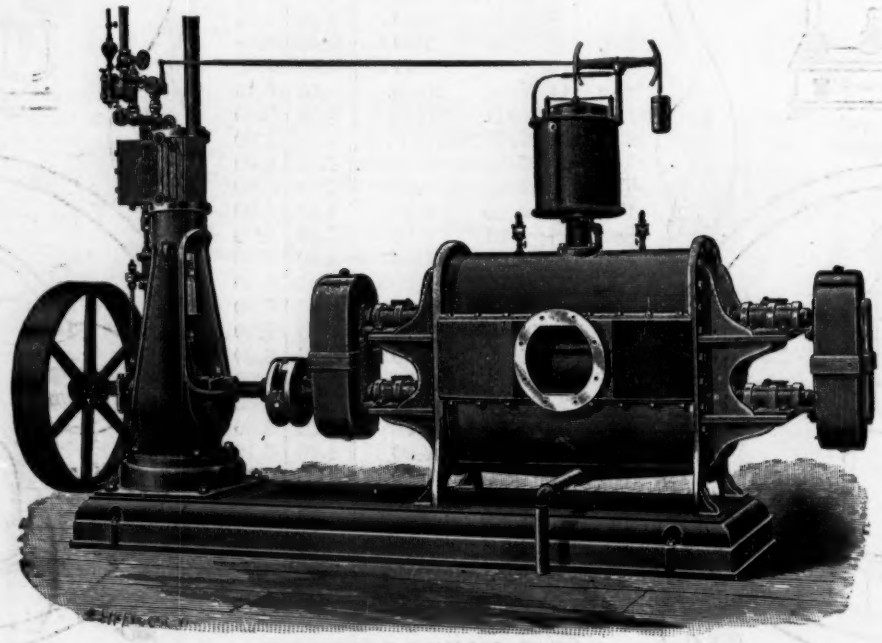

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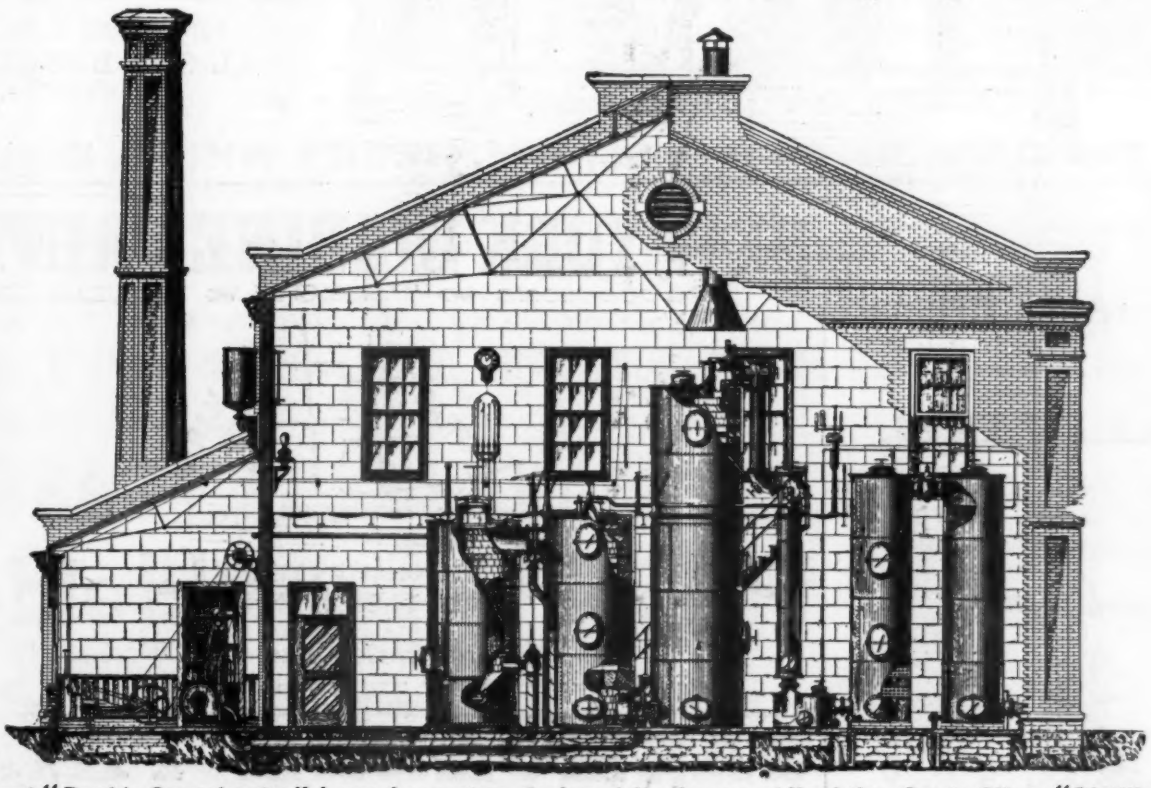

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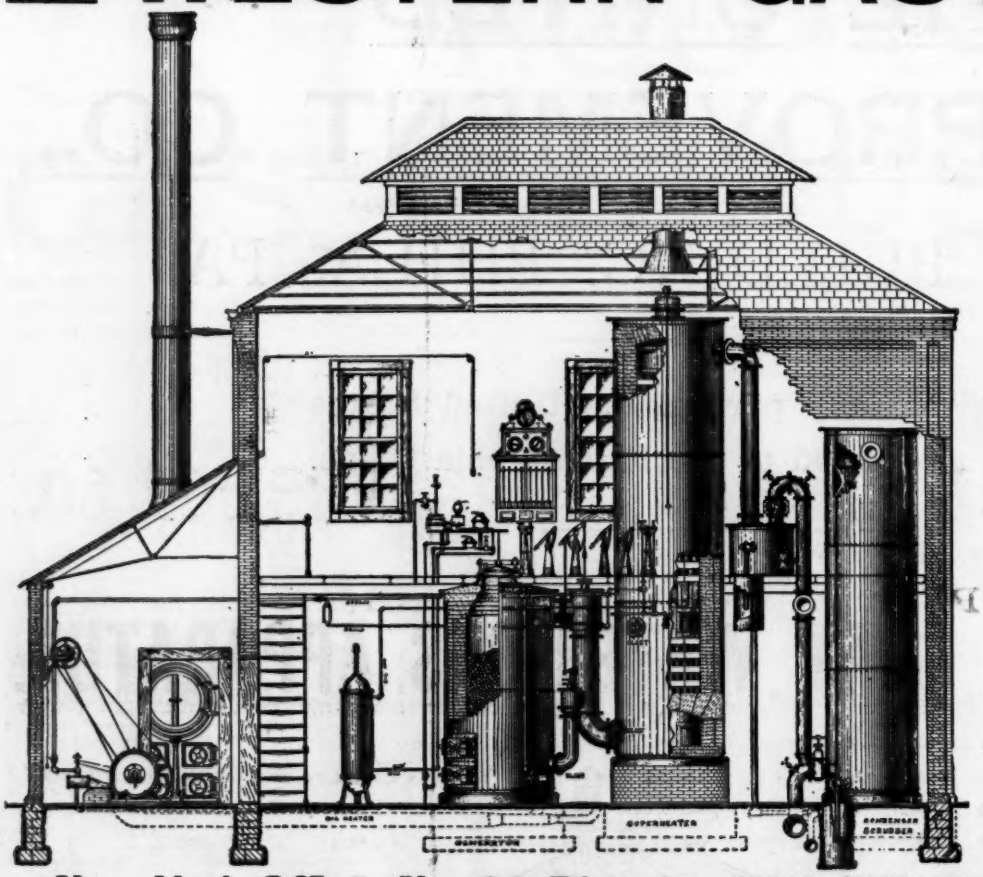

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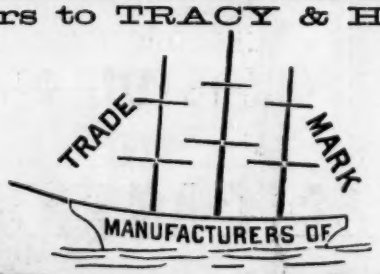

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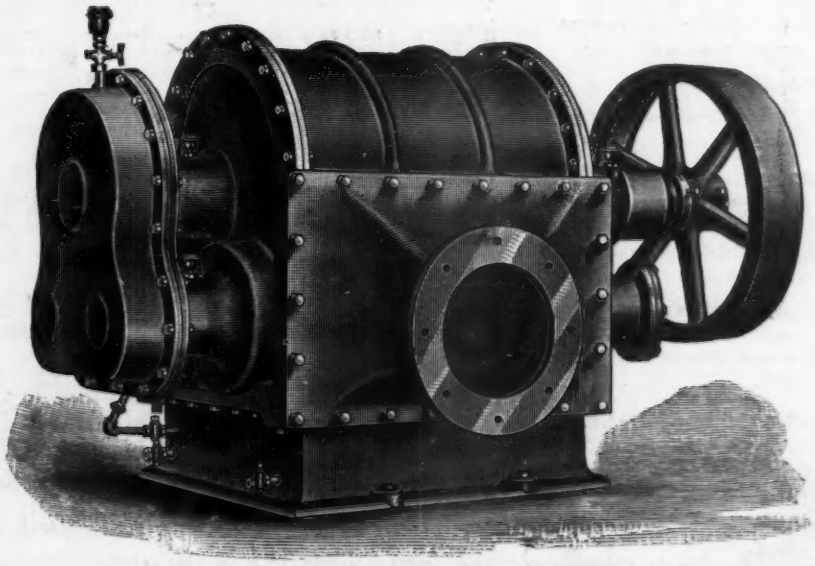

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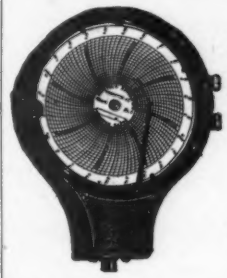

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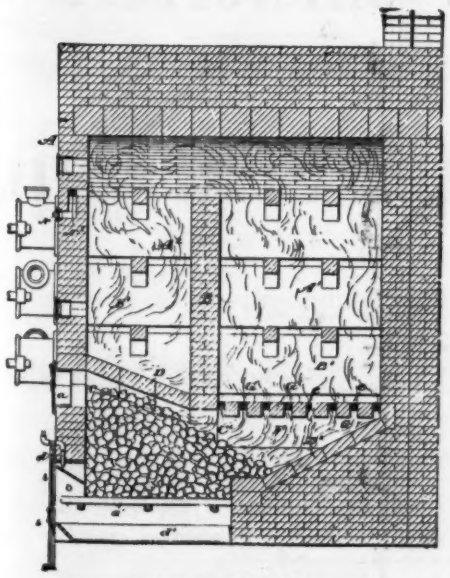

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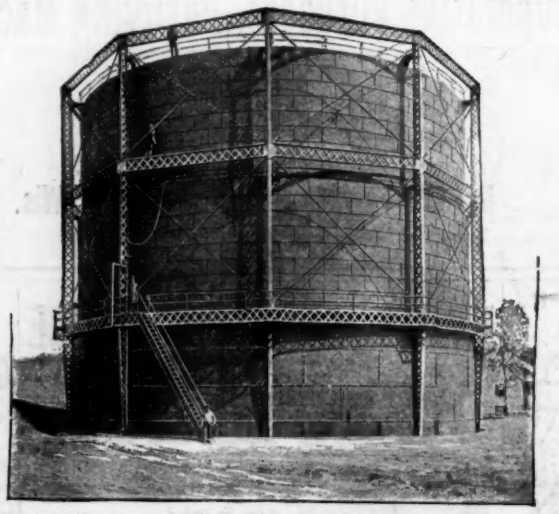

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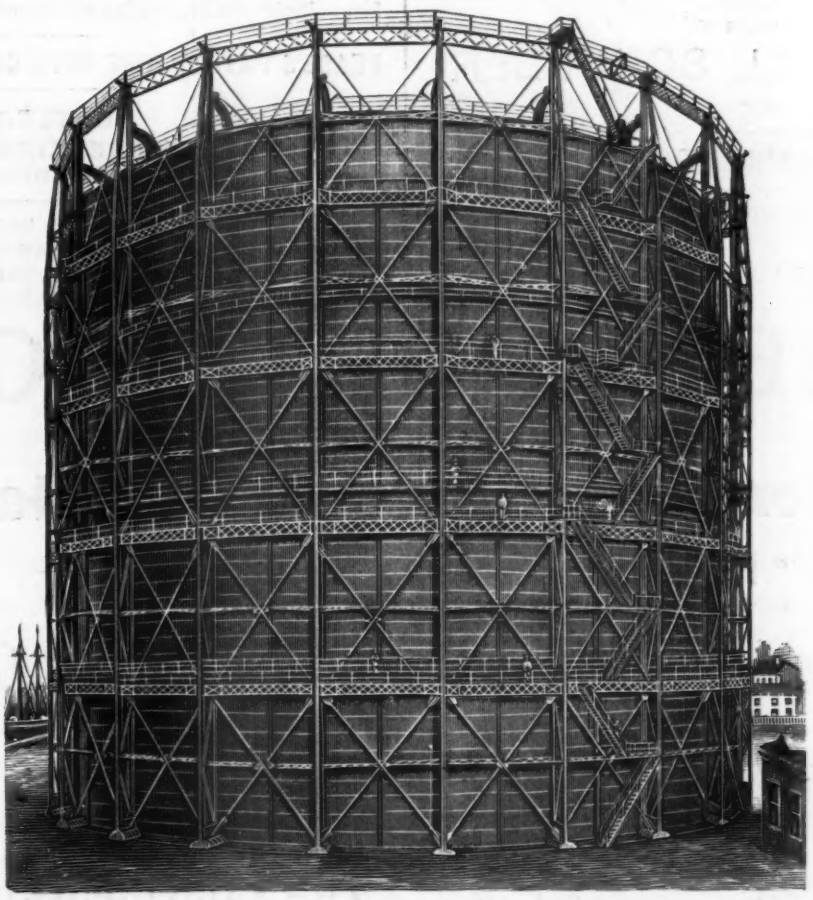

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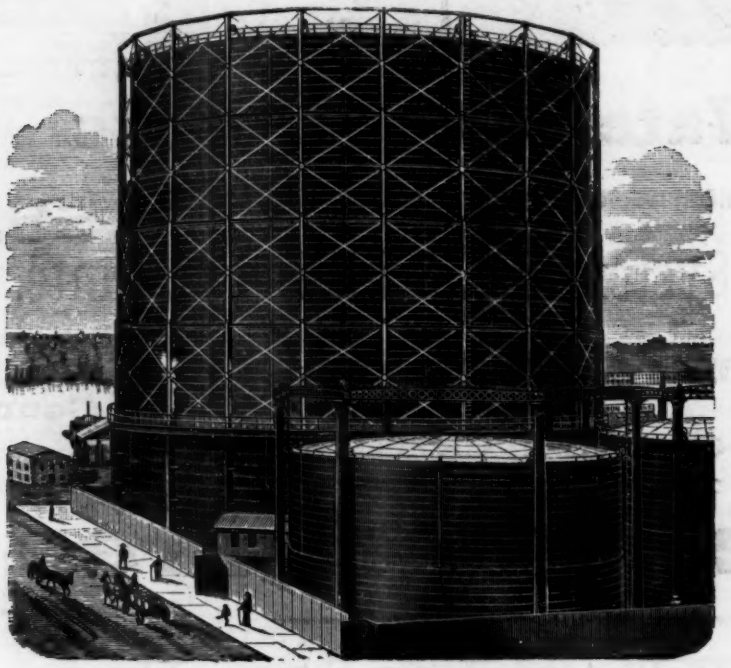

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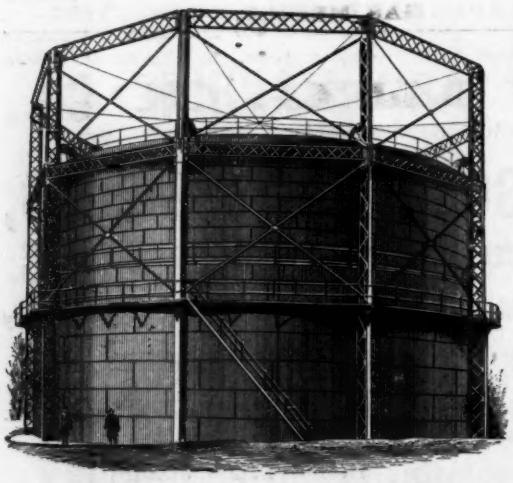

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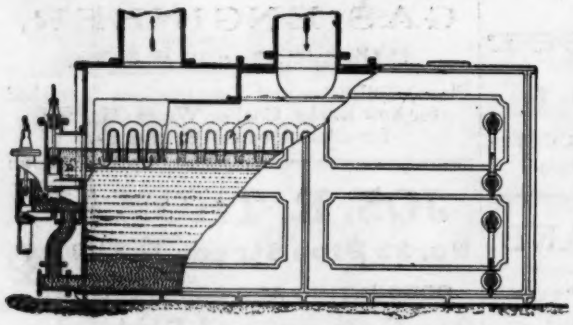

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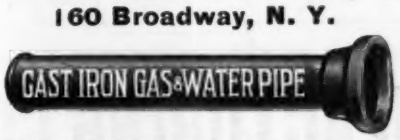

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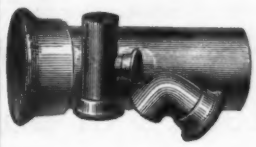

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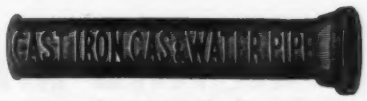

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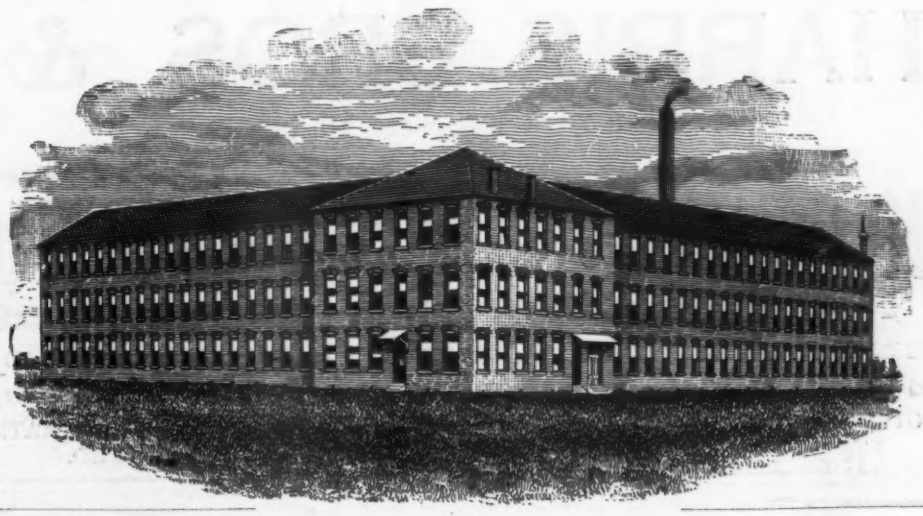

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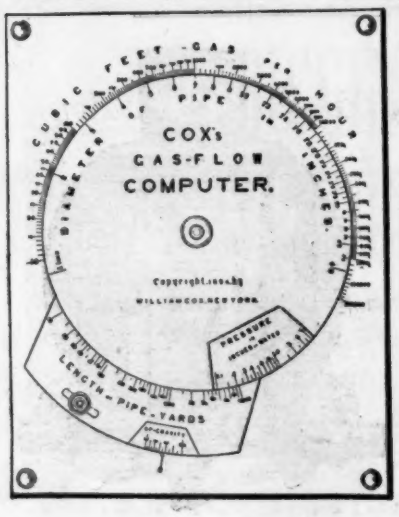

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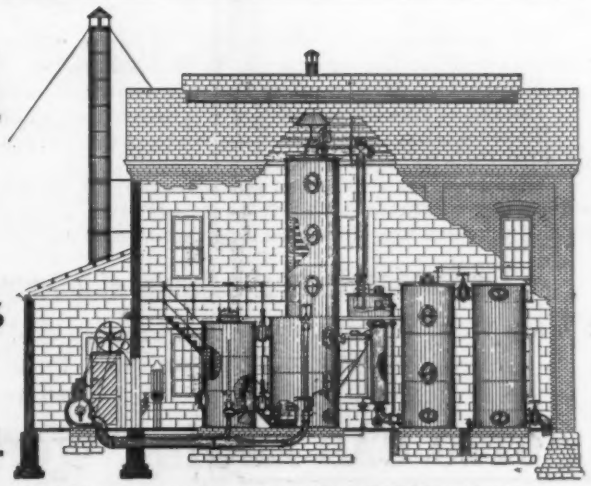

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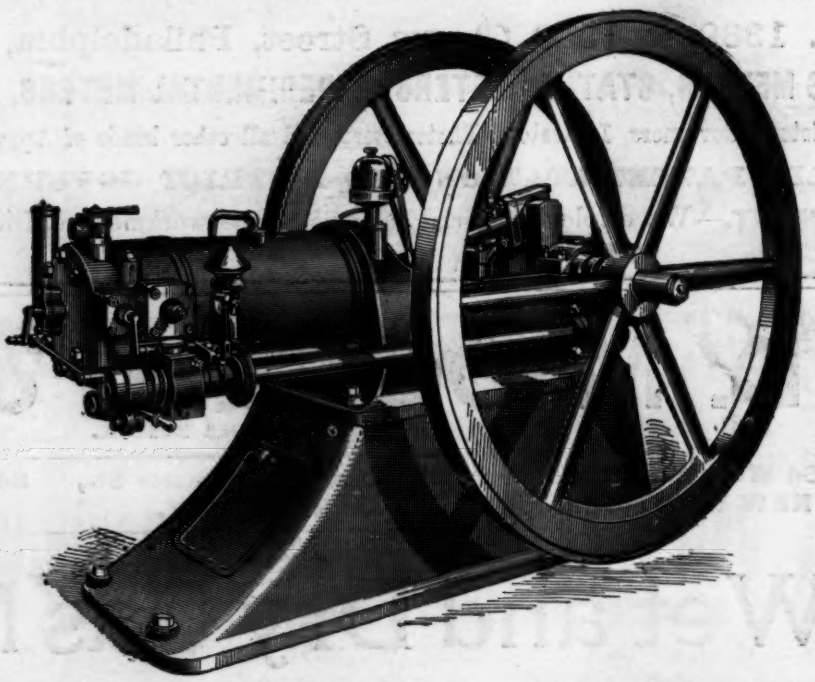

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